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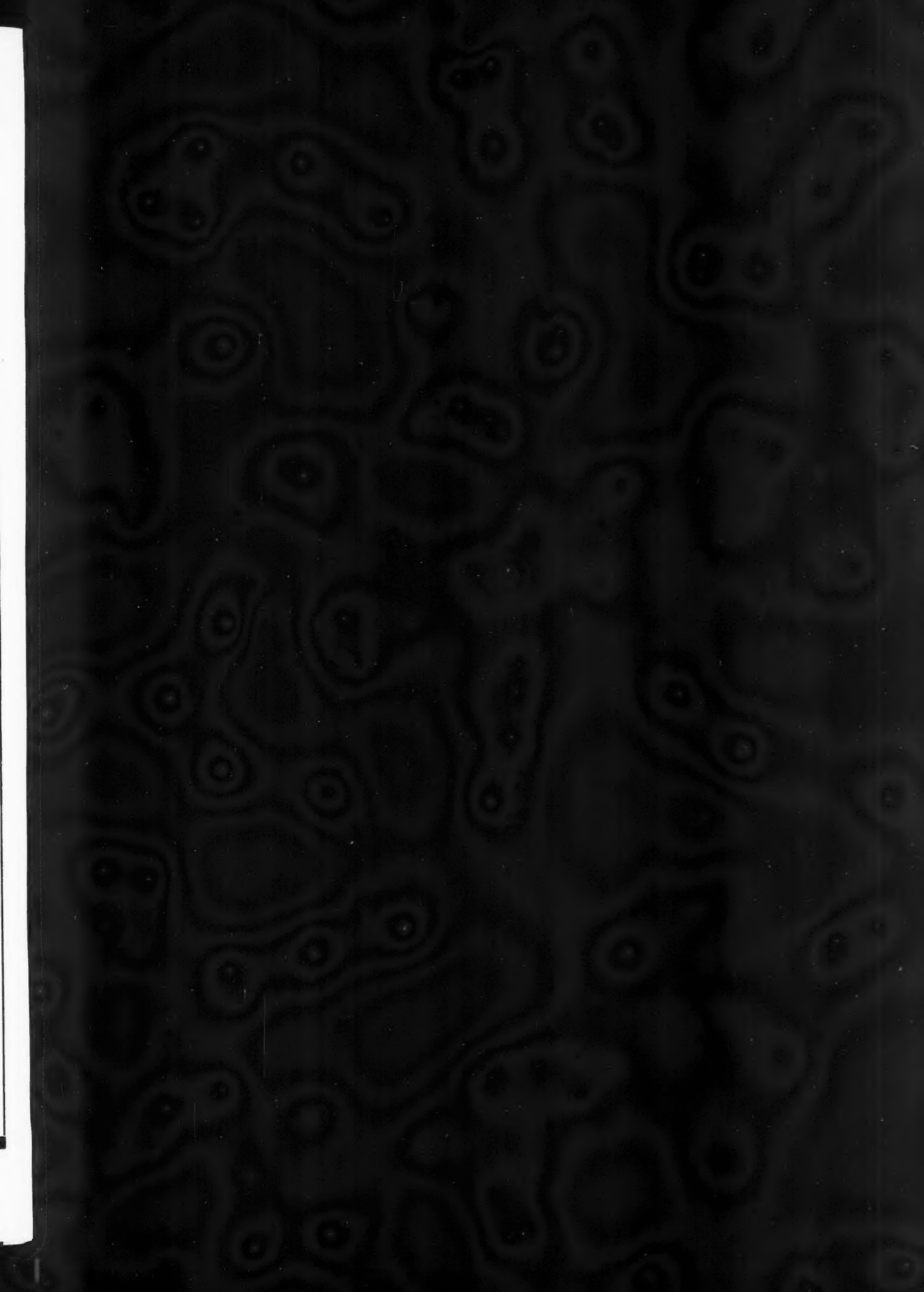

THE ELECTRICAL REVIEW

Volume CXXVIII — No. 3309

Friday, April 25th, 1941

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EDITORIAL, ADVERTISING AND PUBLISHING OFFICES: Dorset House, Stamford Street, London, S.E.1

Telegraphic Address: "Ageekay, Sedist, London." Code: A B C. Telephone No.: Waterloo 3333 (35 lines)

Subscription Rates, Postage free: United Kingdom, £1 16s. 10d.; Canada, £1 12s. 6d.; Colonial and Foreign, £2 1s. 6d. per annum

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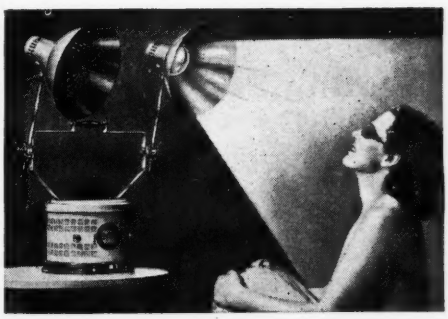

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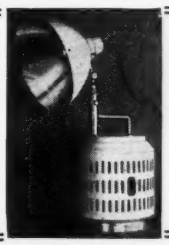

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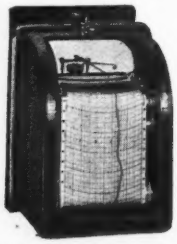

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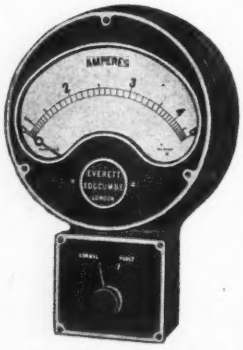

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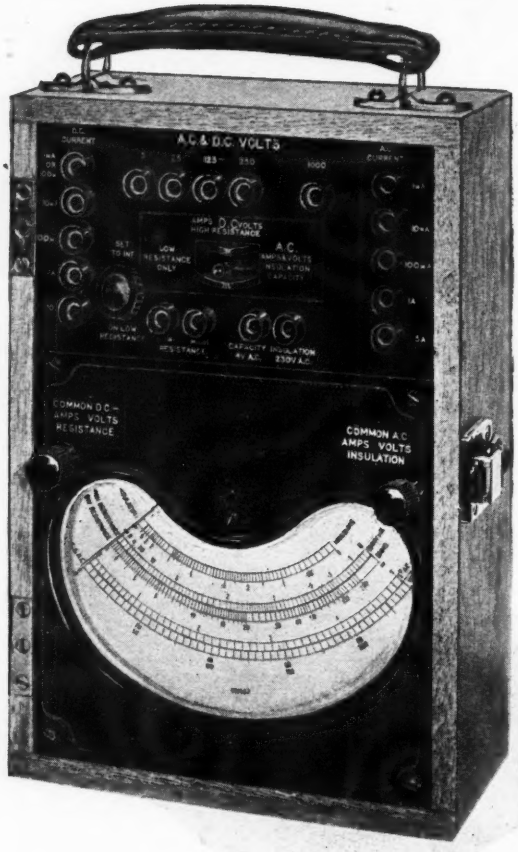

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Essential Export Trade

Present Conditions and Future Aims

ALTHOUGH the nation's efforts are being directed entirely towards the successful prosecution of the war no apology is necessary for the appearance of this number of the ELECTRICAL REVIEW which is devoted to the consideration of various phases of export trade.

Overseas trade is an essential part of our life in peace or war. If we lose it now we shall have lost the war, for we could never recover it in time to save our economy in the face of the very acute problems which will arise when the war ends. We shall not pretend that it is possible to maintain the pre-war level of exports. We have neither the labour nor material to spare from the primary work of equipping our forces. But sufficient must be provided to keep our overseas trade in being and at as great a volume as can be managed. Our main purpose must be to maintain contact with our customers and preserve the goodwill which has been laboriously built up during the past few years. This will enable us when peace reigns once more to stimulate and satisfy the great trade revival which must inevitably follow the slowing-down or stagnation of normal development during the war period.

Another point which has to be remembered is that the war has to be paid for. Our internal resources are still strong but they are very largely based upon our overseas commerce. To a great extent we are drawing upon our reserves which depend upon our export trade for their maintenance. We cannot avoid a shrinkage of these resources, but we must guard against their depletion.

Electrical Industry's Strength

Thus even under war conditions we are maintaining, and must still maintain, a considerable volume of overseas trade, and the electrical industry shows in this issue its virility in a striking manner. While production for export is forced to take second place to war requirements, this export number is a token of the capabilities of one industry whose entire resources will be turned to the fulfilment of peacetime orders when the time comes. In some ways the war will increase those capabilities, for it has taught us to economise in material and labour and has engendered the use of substitute materials and methods without sacrifice of efficiency, all of which should improve our position in what will be a highly competitive field.

Present circumstances compel us to exercise a certain amount of "selectivity" in connection with overseas trade. The President of the Board of Trade has stressed our need for dollar exchange and the desirability on this account for exporting as much as possible to the United States. Next in importance come the other "hard" currency countries, including some of the South American republics. This involves the diversion of certain classes of goods from some other markets, such as the Dominions, but it helps our exporters to maintain their contacts with some of the more "difficult" peacetime markets.

Desirable Exports

Selectivity is also imposed by the necessity for conserving materials. The aim is to sell such articles as represent a high conversion factor: goods which in their finished state can command a price far in excess of the value of the material employed in their manufacture. It is in this direction that electrical machinery and equipment enjoy a considerable advantage and should be favourably regarded by the Board of Trade when export licences are required.

These are all matters which fall within the scope of the Export Groups, of which there are about forty concerned with the electrical and allied industries. Some indication of their aims and operation and a list of electrical Groups are given in this issue.

Assistance in all matters relating to export is being given by the Group organisations to all members, whether they belong to their trade associations or not, although it is a fact that one of the results of the establishment of the Groups has been a considerable increase in the membership of the associations. Among the numerous routine matters in which the Groups are rendering aid are the allocation of materials, shipping, insurance, export licences, exchange information and the financing of orders involving credit sales.

A final word to our customers is called for. While we are forced at the moment to seek their indulgence for occasional delays in the fulfilment of their orders, they

may be consoled by the knowledge that if at the moment we are unable to meet their requirements so promptly as in the past other countries to whom they might turn are in no better case. We may hope, therefore, that they will bear with us in any unavoidable delays, looking forward with us to the early resumption of normal trade relations, when this country will be found more than ever ready and equipped to meet their needs. Of no industry will this be more true than of our own, the electrical industry.

B.E.A.M.A. in 1940

IT is unfortunate that the British Electrical and Allied Manufacturers' Association has been unable to tell the full story of its activities during the past year, for it would provide an interesting record of invaluable service to the industry as a whole. The changes in the structure of industry, the need for maintaining exports in the face of calls for men and materials for war purposes and the multitudinous Orders issued by various Government Departments have all combined to throw an enormous extra burden upon the Association's already well-occupied staff. The main part of the report is devoted to the work of the Technical Committees which have managed to produce some useful revisions of existing specifications, with war conditions in mind, as well as to proceed with the consideration of some new standards. Recognition of the value of the Association is provided by the fact mentioned in the report that thirty new members joined during the year. Under the B.E.A.M.A.'s auspices three new Associations dealing with domestic, commercial and industrial refrigeration were established during the year. Other branches in which organisation was proceeded with were X-ray equipment and arc-welding electrode manufacture. The task of holding the electrical manufacturing industry together during the war is being well performed by B.E.A.M.A., and thanks to its efforts the industry should emerge stronger than ever when the peacetime forward movement begins.

Meter Certification

IN relaxing the statutory requirements regarding the certification of meters in the interests of conservation of labour, the Electricity Commissioners are only giving official sanction to a state of affairs that already exists or is in a fair way to do so. Depletion of staffs of meter departments due to the claims of war work makes the full procedure called for under the Act of 1936 clearly impracticable to carry out, but generally the position will be no worse than it was less than three years ago before " the appointed date." Maintenance testing is in a different category and the need for it is not likely to be lessened as a result of the need to use old jewels and pivots and to retain old meters in service. Much of the necessary routine testing can be done by relatively inexperienced female labour under supervision. The fine degree of accuracy normally proper in commercial metering is not to be looked for when there is more essential work for the trained meter engineer. Much can be done, however, through the pooling of testing resources by undertakings.

Lightning Effects

RECOGNITION of the complexity of lightning phenomena has been gradual. Meteorologists and physicists continue their investigations, while engineers have become aware that lightning effects on overhead lines conveying electric power are incapable of representation by simple voltage, or current, surges of standard shape. The literature of the subject is very extensive, but there has been very little endeavour to translate the data of various authors and of different methods of investigation into terms applicable to the needs of transmission engineers. The immediate purpose of an official E.R.A. communication to the I.E.E. has accordingly been synthesis and correlation on the widest possible basis. Not only has the attempt shed new light on causes and effects, but re-analysis has permitted fresh interpretations of records which seem likely to disturb beliefs and upset accepted values, though some of the conclusions, which are very briefly summarised on another page, will require experimental confirmation. It was hardly within the scope of this report to make detailed suggestions about methods to be employed in further research. It seems of more importance to stress the authors' conviction that progress will be best assisted by closer co-operation between investigators of different aspects of the phenomena and the use of different kinds of apparatus at the same locality, since it appears to be more promising to strive for independent data from as many aspects as possible of the same lightning flashes rather than to conduct individual experiments at various points, which have later to be correlated. The final emphasis of the report is upon the fact that engineers are concerned not only with circumstances they have to guard against, but also with the frequency of their occurrence, thus necessitating statistical analysis of records spread over several years.

Science and Society

TESTIMONY has been paid in the Press to the many-sided activities of Lord Stamp. His faith in the value of scientific progress was typified by his acceptance of the presidency of the Electrical Research Association for a two-year term (1939-41). More than that, he looked to the popularising of science as a means of creating among members of the general public a state of mind in which conviction is formed by knowledge and not by wishes only. He realised to the full the peril that attended the conventional, but unreal, separation of the scientific from the other aspects of corporate life. In the profoundly thoughtful study of the impact of science upon society which formed his presidential address to the British Association in 1936, he insisted upon the need to balance success in the " science of matter " by an equal advance in the " science of man." It is indeed a bitter irony of fate that one who believed so firmly in the mission of science to relate material progress to human happiness should have met his death through the foulest abuse of science that has ever scourged our world.

More Room

NOTWITHSTANDING the progressive reduction in the space required per kW of electrical apparatus that has been brought about by developments in design, electrical engineers in factories still have grounds for complaint that every square foot they require for their plant and cables is yielded grudgingly by the management. To the higher authorities this represents so much factory area which could be devoted to productive output. Often this is a short-sighted policy as a good engineering layout for the electrical installation which pays proper regard to the possibility of extensions and also of increasing short-circuit values certainly facilitates production. Thus, the location of substations near load centres would not only save expense in cable runs and consequent losses, but would enable the larger motors to be supplied direct at high voltage, and this would in itself get over many of the difficulties of 400-V distribution and save money. Works electrical engineers may well envy the relative freedom of their colleagues in the supply industry in choosing the most suitable technical conditions for distribution. It is abundantly clear that there is a real need for an intensive educative effort outside the electrical industry.

Maintenance of Exports

War Conditions and Post-war Policy

By Sir Felix Pole

THE desirability of maintaining as large a volume of export trade as circumstances permit, is necessary in view of the British Government's large purchases from overseas. That the authorities are fully alive to this has been made apparent in various official announcements and by the formation of an Export Council, of which the President of the Board of Trade is chairman. The work of the Export Council is to promote the greatest volume of export trade which can be achieved under the conditions of war.

The share of the British electrical industry in export markets is an increasing one. Experience of recent years shows that British electrical goods are recognised as " quality " products, that in general the performance of British apparatus is better than foreign, and that in many cases prices are competitive. I think this is particularly so in the case of heavy engineering products.

However, it is in the manufacture of lighter goods, where deliveries are from stock or manufacturing times are short, that the immediate value to the country of export trade is most marked. Unfortunately these are the products that are often manufactured locally in overseas territories. Nevertheless, it remains true that articles which can be exported immediately will provide foreign exchange in the quickest time and, within the limits imposed by direct war work and transport facilities for articles which are necessarily bulky, this class of export should have every encouragement.

The author, whose companies are largely concerned with overseas electrical trade, shows why export contacts must be preserved during the war in preparation for the great forward movement which may be expected when hostilities cease

Heavy engineering products, for which the British electrical manufacturer finds a more ready export market, do not provide foreign exchange so rapidly owing to longer periods of delivery. Notwithstanding, such exports are important, as foreign currency will still be required for a long time to come. In addition, long-term contracts give the British exporter more opportunity of maintaining his contact with a particular client or territory, and enable him to consolidate relations and to extend the market further. I regard this point as important since, after the war, the export drive must be intensified and manufacturing facilities in Great Britain must for other reasons be turned over very largely to export work.

Now and Afterwards

As a general statement it is fair to say that export activities of British electrical manufacturers are limited at the present time by the availability of raw materials and manufacturing facilities. After the war I feel sure that such activities will be limited only by the amount of export business which can be obtained in competition with foreign countries.

It is impossible to forecast how many nations will ultimately be engaged in the present war. A detailed examination of export markets at the present time might, therefore, yield results bearing little relation to possible after-war conditions. These doubts are less in the case of a few countries like the Latin American states and a long-term export policy adopted in regard to them at the present moment should be less subject to possible disturbances by the future course of events. The position is further complicated by the difficulty of assessing which countries will be in a position to manufacture electrical goods for their home consumption and which countries will be capable of exporting after the war.

Sir Felix Pole is chairman of Associated Electrical Industries, Ltd.

I am, however, convinced that so far as we are concerned, Great Britain must place itself in a position to take a leading share in markets previously served by Germany and Italy. The present time is favourable to fostering such new connections, since our enemies are cut off from certain countries. Moreover, world sentiment against the rulers of Germany and Italy creates an atmosphere in which it should be easy for British traders to work. British exporters, aided by the Government, must to-day sow the seeds for the harvest to be reaped after the war.

It is to be expected that after the war many countries will desire to be self-sufficient from a manufacturing point of view. It is uncertain that as regards electrical manufactures such attempts will in general succeed, although it will no doubt take time for some countries to realise that in times of peace the maintenance of heavily subsidised local industries may be economically unsound. Military policy might, however, in the case of some countries override economic necessities. In such territories British companies should consider establishing local subsidiaries to strengthen their competitive position for products such as heavy machinery and complicated plant which would still have to be imported from abroad.

Finding New Markets

The methods of cultivation of new export markets are many and various and they depend on the class of export and on the particular territory. One thing is common to all, and that is that the building up of a substantial and lasting export market is necessarily a procedure which takes much time.

I do not propose to quote statistics since, as already suggested, overseas markets after the war will depend on which countries are ultimately engaged in war, and to what extent they are affected. That the potential demand for electrical goods and apparatus will be great cannot be denied. British electrical industry in the past has shown skill and initiative in developing export markets, and thereby has contributed materially to the national cause.

In the future, markets may be vastly different. Some of them may be new and undeveloped, thus demanding still more skill and still greater effort as well as the employment of new methods. Aid from the Government will be expected, and will be needed, but it is essential that when such help is required, it shall be given freely and speedily, so that the British electrical industry can fully employ its resources and outstanding technical ability in helping to consolidate the peace.

Latin American Markets

General Survey of Present Conditions

By a South American Correspondent

IN analysing trade prospects in South and Central America the paramount consideration to bear in mind is that all of the Republics there are producers of primary commodities such as agricultural and pastoral products, minerals, etc. Therefore, the economic soundness of these countries depends upon good markets abroad for their products at satisfactory price levels. Following the international crisis of 1931, the South American countries—like all primary producing countries—were faced with internal difficulties owing to the economic problems arising from the low level of commodity prices over many years, which had led to the imposition of control of exchange and importation in endeavours to balance international payments.

Upon the outbreak of war in September, 1939, it appeared that prolonged hostilities in Europe might bring about a general improvement in the South American countries by strengthening their purchasing power through increased demand and higher prices for primary commodities. Unfortunately, however, events in Europe in the early months of 1940, and the consequent application of the British sea blockade to almost the entire Continent, led to the loss of important European markets for South American products. This, in turn, led to the piling up in Latin America of surpluses of primary products which are largely unsaleable, thus confronting Latin America with a problem inimical to all aspects of economic life and particularly the ability to purchase manufactured articles from abroad. The following table shows the approximate proportions of exports from the principal South American countries taken by the European Continent (excluding Great Britain) in the year 1940 compared with the last pre-war year, 1938 :—

	1938 per cent.	1940 per cent.
Argentina	44	24
Brazil	43	16
Chile	31	6
Peru	24	4

The figures for Chile exclude nitrate shipments from that country and for the year 1940 cover ten months only.

This is the first of a series of articles written by an expert in close touch with the Latin American markets. In this first contribution the general background of these markets is surveyed, and subsequent articles will deal with conditions in individual countries, with special reference to the electrical industries, credit conditions, methods of payment, etc.

These figures amply demonstrate the adverse effects upon South America's export trade which will be exercised by a prolongation of the present situation in Europe, as also the necessity for finding alternative markets for primary products. The present position, however, is that the United States and Great Britain are almost the only two important markets left open for South American products, and, as both countries are anxious to recapture Germany's former large trade with South America, it is in the best interests of both countries to assist in solving the problem presented by the present reduction in South America's purchasing power.

In the table below, the approximate percentage of imports of British goods into the principal South American countries is compared with that from the chief competitive countries, namely, the United States, Germany and Japan :—

Imports into South America.

Percentage of total imports from :

		U.S.A.	U.K.	Germany	Japan
Argentina ..	1932	13.5	21.5	9	1.6
	1938	17	20	10	3.7
	1940	29.1	19.8	—	2.1
Brazil ..	1932	30	19	9	0.4
	1938	24	10	25	1.3
	1940	51.9	9.4	—	2.4
Chile ..	1932	25	13	15	0.6
	1938	28	9.5	26	2.5
	1940*	46.5	9.6	4	5.8
Peru ..	1932	27	17	9	5.9†
	1938	27	8	16	3.3
	1940	53.1	9.2	1.4	5.8

*Ten months only. †Year 1934.

The sharp fluctuations shown in the above figures demand some explanation. It will be seen that, despite competition, British goods have continued to represent a steady 20 per cent. or so of Argentina's total imports, this being due to the uniquely reciprocal nature of Anglo-Argentine trade—that is to say, that Britain represents the largest market for Argentine grain, meat, etc., in return for which Argentina has taken British manufactured articles, coal, etc.

On the other hand, the expansion in imports into Brazil, Chile, and Peru from Germany between the years 1932 and 1938 was due to official subsidisation of German exports, conducted on a "compensation" basis through the artificially depreciated *Aski* mark. It will be seen that the growth in imports from Germany between 1932 and 1938 was mainly at the expense of imports from Britain, which showed a sharp decline. The effects of the European war are clearly defined in the figures for 1940, which show that, whilst South America's imports of German goods have been practically eliminated, due to the British blockade, imports from the United Kingdom have remained fairly constant, those from Japan have expanded slightly, but still represent only a low percentage, whilst the outstanding feature is the enormous expansion in South America's purchases from the United States.

In the democratic countries of South and Central America, there is very general sympathy with the Allied cause in the present war. There is sympathetic understanding also of Britain's wartime economic policy, including the necessity of the naval blockade. It is realised, moreover, that Britain, faced with transport difficulties and the necessity for discriminatory expenditure abroad, cannot alone deal with the vast problem of South America's surplus products. Therefore, Latin America is looking principally towards the United States to help solve this problem.

Happily, there are increasing indications that the Washington Administration will play its full part, as exemplified by the recent approval of an increase in the capital of the Export-Import Bank by $500,000,000 to enable large credits to be granted to South America for the purpose of carrying crop surpluses and to finance the importation of capital goods particularly to develop local manufacturing industries and transport undertakings. Already during the first year of the war, imports into the United States from Latin America, compared with the like period of 1938-39, rose to $649,400,000 from $499,900,000, whilst North American exports to Latin America rose to $789,500,000 from $554,600,000, notably machinery (including electrical equipment) and vehicles, and iron and steel products.

So far, therefore, the most apparent effect of the European war upon the Latin American markets is the intensification of inter-American trade, particularly with the United States. A second development, however—and one of even more important long-term significance—is the tremendous further impetus given to the national manufacturing industries such as occurred after the Great War of 1914-18. The latter factor is bound to exercise increasing influence upon the various lines of imported goods, and it is significant that, for some time past, engineering goods, iron and steel, electrical equipment and transport items have figured prominently in the trade returns of the principal South American countries. It is reasonable to suppose that, with the further industrial development now under way, the potential demand will increase, and will embrace particularly the heavy products of the electrical industry, bearing in mind especially the immense water power resources.

Examples of Industrial Development

Among many pointers towards industrial development, a few only may be mentioned. Uruguay initiated before the war a vast scheme of hydro-electrification on the Rio Negro, although this is partly held up through present inability to obtain materials from the German contractors. Brazil has established a national company for manufacturing iron and steel, which is expected eventually to make that country independent of such imports. Brazilian factories, mainly in the State of São Paulo, now send an increasing number of lines of manufactures to other South American markets. A progressive expansion has occurred over recent years in the production of electric lamps, electrical apparatus and batteries in Brazil, thereby causing imports of these articles to decline.

In Argentina, there existed 946 electric power plants at the end of 1939, and in that year the production of electricity totalled 2,461 million kWh compared with 2,328 millions in 1938 and 1,861 millions in 1935. In Chile, the general index figure of production of all manufacturing industries (base 1927-29 = 100)

rose in October, 1940, to 177.3, which was the highest ever registered.

Despite wartime difficulties, the British Government has taken commendable steps to recapture British trade with South America, particularly through the despatch of a Trade Mission under the leadership of Lord Willingdon, which received an enthusiastic welcome in every country visited. Whilst a detailed report of the results of the Mission's visit is not yet available, it is understood that it cleared up many difficulties, especially in relation to the question of delivery of British goods. In this connection, it must be emphasised that, apart from the ability of British exporters to quote smooth terms of delivery, the success of Britain's endeavours to increase trade with South America depends basically upon British exporters being able to keep their prices keenly competitive. In respect of both prices and delivery terms much obviously depends upon co-operation by the Government departments responsible for the control of raw materials.

The foreign exchange factor—*i.e.*, the ability to convert the proceeds of British exports into sterling—is obviously an outstanding consideration. The chronic instability of South American exchanges has now been eliminated through the control of credit conditions in most countries through a central banking system. Indeed, stability of exchange is now ensured by means of the arrangements which Britain has recently entered into with the principal South American countries, whereby payments between such countries and the sterling area are settled through special accounts at agreed official exchange rates.

The question is now rather one of the actual volume of exchange available, and, in view of the present reciprocal nature of international trade, this depends primarily upon the extent of Britain's purchases of South American products, such as wheat, meat, wool, etc. For example, whereas a recent Board of Trade Order subjected exports to Brazil, Chile, Colombia and Peru to licence, from one aspect this new Order protects British exporters inasmuch as it obviates over-exportation to countries where the supply of sterling exchange is at present stringent. However, in view of the recent active efforts of British exporters to increase their trade with South America, it is to be hoped that the position will soon be clarified by an official announcement by the Board of Trade to the various export groups detailing the régime to be followed in applying the export licencing procedure.

As during the war of 1914-18, present hostilities have resulted in a partial interruption of trade between Britain and South America, which is equally regretted, but whose causes are equally well understood on both sides of the Atlantic. South America, however, is a continent of vast undeveloped possibilities, and is likely after the war to play a far more important role in the economic life of the world than ever before. Indeed, taking the long view of South American affairs, it is safe to assume that the countries there, so rich in natural resources, will eventually be called upon to revitalise an exhausted Europe.

Therefore, it is of the utmost importance that Britain should at once adopt a long-term policy in regard to her trade with South America so as to pave the way for the resumption of mutually profitable trade when the hampering conditions of war have been removed. The Willingdon Mission expects to make recommendations on many subjects of value both during and after the present war. Under this long-term policy, British merchants and exporters can also play their part by thoroughly exploring the potential markets for British goods. European markets, and particularly British markets, will always be essential to South American products, and, reciprocally, there should normally be an expanding market for British products.

There is no reason to believe that the closer relations developing between the North and South American Continents will, under the wise leadership of President Roosevelt, be eventually other than beneficial to the flow of trade between South American countries and Europe. Indeed, there are already indications that negotiations proceeding between the leading South American countries and the United States in respect of trading agreements may be of a tripartite nature, so as to include Great Britain.

Export Group Operation

How the System Works in Actual Practice

By K. J. McKillop

IN the course of some eight months' working, the Executive Committee responsible for the Export Group, of which I am the secretary,* has had to deal with many and varied problems invariably associated with any group activity. The fundamental object which it was desired to attain was in the first place made clear by the Export Council of the Board of Trade. The operative policy necessary to attain this object appeared equally clear, but to pursue this policy inflexibly and at the same time ensure the avoidance of individual hardship has not proved simple.

Problems of the individual arose and will still arise, necessitating compromise in their settlement. Like all compromises they are never completely satisfactory, and in time these contentious and vexatious matters blunt the individual, if not the collective, keenness vitally necessary to the successful attainment of the Group's aim. My experience indicates the absolute necessity of constantly reminding members that the Export Group is not a trade association, but is, in fact, a national organisation charged with a mission essentially national in interest and character. For this reason the needs of the individual member must at all times be subservient to the needs of the Group. Adherence to this fundamental principle by the Executive of the Group when determining the Group policy appears, therefore, to be a first essential.

Although the author speaks from experience as secretary of a particular Export Group, his observations are applicable to the other Groups associated with the electrical industry

Trade associations may, and do, vary their policy and procedure in order to cater for the requirements of their separate members. A limit is not set to the degree to which compromise can be effected to suit these individual requirements. Such associations are primarily concerned with the individual and collective prosperity of their members. An Export Group is not directly concerned with the prosperity of its separate members. It is concerned with one object, and with one object only and that is the acquisition of desirable foreign exchange.

The Government places in the hands of the Group certain vital raw materials, and it requires that these raw materials shall be ultimately transformed into desirable exchange in good measure and without any unprofitable dissipation. It is unnecessary to deal here with the purposes for which this foreign exchange is required and employed. It is essential, however, to keep in mind that every overseas order either lost or secured at an unnecessarily low price level directly limits the power of this country to purchase the equipment with which she is fighting for her very life.

It is realised that the foregoing constitute "first principles" in the matter of wartime export. I am anxious, however, to establish firmly the simple fact that an Export Group must ensure that such materials as are made available to it are only exported in the most desirable direction, and only exported at the best possible price level, consistent with ensuring that there is no exploitation of the customer. Moreover, unlike a trade association, an Export Group has no moral right to permit unprofitable or even comparatively unprofitable exports in order to assist or protect any individual member or members.

The steady pursuance of a policy embracing these ideals is likely to give rise to some friction within the Group. It is comforting at such times for those responsible for dictating the Group policy, to know that authoritative help and support is always available from the controlling body—the Export Council of the Board of Trade. I have found that this latter body is always ready and willing to give real and practical guidance to those responsible for any Export Group.

It must not be considered, however, that the Export Group or its executive exists merely to police and control the Group members. The Group organisation has many tasks to perform, all designed to assist the constituent members. Amongst other tasks, it should :—

(1) Provide means for the fullest collaboration between members on all matters affecting their export trade.

(2) Maintain an adequate and beneficial liaison with the Export Council and render more easily available the trading facilities which are offered to exporters by various sections of the Department of Overseas Trade.

(3) Obtain and arrange the internal Group distribution of controlled raw materials. Where these materials are in short supply considerable statistical data is often required in order to establish a justifiable case for their acquisition. The collation of such data is a task for the Group organisation.

(4) Generally keep members advised as to the facilities offered by the various Government and Government sponsored commercial departments, such as the Export Credits Guarantee Department, Area Transport Offices, Ministry of Shipping, etc.

* Insulated Conductors Export Group.

(5) Undertake the preparation and distribution of statistical information bearing on the trend of markets affecting the Group's exports in all or selected markets.

The responsibility referred to under (3) of the foregoing will undoubtedly devolve upon the Group organisation. From past experience, I feel the urge to make a special reference to the statistics referred to. There has been, and still is a tendency on the part of certain sections of the Industrial Supply Department of the Board of Trade to demand statistics prior to the granting of period allocations of materials, to a degree that is wholly impracticable. I appeal, therefore, to the authorities to realise that the preparation of such statistics would be a difficult enough matter in normal times with a full operative staff available. Today, with staffs seriously depleted owing to the demands of the Services, the preparation of these statistics is often a physical impossibility. The Government should realise this fact, and not on the one hand charge an Export Group with the willingly accepted responsibility of policing its export industry, and on the other hand place upon it the burden of producing extensive statistical proof that it is doing so.

Export Groups

Electrical and Allied Organisations

THERE are forty or so Export Groups and sub-groups serving the interests of the electrical industry and allied branches. We think that it may be of service to give a list of these both to British manufacturers who have not yet joined their appropriate group and to overseas buyers who wish to obtain information regarding the position with regard to the export of particular classes of electrical goods and machinery.

Group.	*Secretary.*	*Address and Telephone No.*
Accumulators Export Group	Mr. E. Powell	27, Bedford Row, London, W.C.2 (Chancery 7221)
Arc Welding Electrodes Export Group	Mr. A. G. Seaman	36, Kingsway, W.C.2 (Holborn 0502)
Electrical Goods & Apparatus Export Committee	Mr. F. A. Rogers	36, Kingsway, W.C.2 (Holborn 0502)
Sub-groups :— Commercial Electric Instruments and Instrument Transformers; Conduit Fittings; Electric Water Heaters; Electric Wiring Accessories; Electro-medical Appliances; Fan & Fractional HP Motors; Heating, Cooking and Domestic Appliances; Insulators and Insulations; Portable Electric Tools; Small Switch & Fuse Gear (up to 660 V. 500 A); X-ray Apparatus		
Electrical Machinery Export Committee	A. G. Seaman	36, Kingsway, W.C.2 (Holborn 0502)
Sub-groups :— AC and DC Motors and Generators; Electric Furnaces; Electric Traction Equipment; Electric Water Heaters and Steam Raisers; Heavy and Medium Switchgear; Mercury Arc Rectifiers; Motor Starting & Control Gear; Power Transformers; Static Condensers; Steam Turbine, Turbine Reduction Gear, Turbine-Driven Generator Condenser, Turbo-blower & Compressor; Water Turbines		
Electric Lamp Manufacturers' Export Group	Mr. H. S. Hayden	15, Christchurch Park, Sutton, Surrey (Vigilant 6072-5)
Electric Light Fittings Export Group	Mr. F. A. Rogers	Kern House, Kingsway, W.C.2 (Holborn 0502)
Electric Vehicle Export Group	Mr. A. C. Cramb	2, Savoy Hill, W.C.2 (Temple Bar 9434)
Electricity Meter Manufacturers' Export Group	Mr. R. N. Gregor	"Brigg Fair," Gorse Hill Rd., Virginia Water, Surrey (Wentworth 2263)
Graphite Products & Carbon Products Export Group	Mr. H. E. Finch	Morgan Crucible Co., Ltd., Battersea Church Rd., S.W.11 (Battersea 2250)
High-conductivity Copper & Alloys Export Group	Mr. A. M. Kennedy	52-54, High Holborn, W.C.1 (Chancery 8561)
Insulated Conductors Export Group	Mr. K. J. McKillop	High Holborn House, 49-51, Bedford Row, W.C.1 (Holborn 2701 & 7633 Ext. 17)
Boiler Furnace Export Group	McLelland, Ker & Co.	120, St. Vincent St., W.C.2 (Central 7385)
Boilers (Water Tube) Export Group	Mr. A. M. Fairbairn	14, Old Square, Lincoln's Inn, W.C.2 (Holborn 9838)
Compressed Air Engineering Export Group	Peat, Marwick, Mitchell & Co.	York Mansion, 94-98, Petty France, S.W.1 (Abbey 1653)
Fan & Ancillary Equipment Export Group (including heating, ventilating, air-conditioning and dust-extraction plant)	Mr. A. G. Marshall	2, Howard St., Strand, W.C.2 (Temple Bar 1314)
Refrigerating Machinery Export Group	Maj. E. L. Paske	130, High St., Newport Pagnell, Bucks.
Steam Engine Export Group	Mr. I. V. Robinson	36, Kingsway, W.C.2 (Holborn 0502)
Steam Raising Plant Accessories Export Group	Mr. F. N. Marcy	14, Old Square, Lincoln's Inn, W.C.2 (Holborn 9838)
Underground Mining Machinery Export Group	Mr. A. R. Knowles	Sheffield Chamber of Commerce, c/o, Cutlers' Hall, Sheffield, 1 (Sheffield 20324)
Pumps Export Group	Peat, Marwick, Mitchell & Co.	York Mansion, 94-98 Petty France, S.W.1 (Abbey 1653)
Radio Manufacturers' War Export Group	Mr. R. P. Browne	59, Russell Square, W.C.1 (Museum 4031)
Rail & Telegraph Accessories Export Group	Mr. E. L. Heathcote	25, Bennett's Hill, Birmingham, 2 (Midland 2901)
Railway Brakes & Signalling Export Group	Mr. J. Griffith Hall	82, York Way, King's Cross, N.1 (Terminus 6432)
Scientific Instruments & Appliances Export Group	Mr. A. M. Bown	60, Queen Victoria St., E.C.4 (City 1396)
Telephone & Telegraph Apparatus Export Group	Mr. T. F. Lee	Connaught House, Aldwych, W.C.2 (Holborn 8765)

Selectivity in Export Trade

IN a recent speech the President of the Board of Trade said that he was often asked by industries to give them a list of those exports which should be particularly fostered, those countries to which we wish to export in order of priority. This was impossible. Only principles, only the theme, could be stated—the variations were innumerable. The touchstones were these. First, would the export lead to the acquisition of "hard" currency, or would it conversely only give us sterling or run the sterling balance of the importing country too low? Secondly, if the export was not to a "hard" currency country, but to one of the Dominions using sterling, was the export necessary to the Dominion? Thirdly, was the conversion factor high? By this he meant, was the amount of raw material in relation to the finished price small? Fourthly, did the manufacture of the article for export put an undue strain upon an industry which was already working at capacity on munitions?

The permutations and combinations of these four main tests were, of course, infinite. Thus it might be that the export of an article with a low conversion factor—for instance a copper rod—made entirely from imported raw material and exported to a sterling-using Dominion might be desirable. It might be that if the export was not made a munition industry in that Dominion might be interrupted or might have to spend dollars.

On the other hand, supposing that there was a demand in a hard currency country for a precision instrument—in which the cost of the raw material was negligible in relation to its finished price—we could not make the export as the whole instrument industry was working to capacity on naval, air and military instruments.

Empire Markets

Conditions and Prospects

THE electrical engineering industry has every reason to be proud of its war record in export trade. In spite of many handicaps it has succeeded in meeting the requirements of its overseas customers to a degree that could hardly have been expected in the circumstances. In addition, as the war proceeded and the position of shipping and sterling exchange had to be considered with increasing care, the exporter was called upon by the authorities to select his market with especial regard to the cargo space available in its direction and to the currency involved in the transaction.

In peacetime Empire countries purchase about three-quarters of our electrical exports and we must look to them to continue their custom, if not to increase it, in order to maintain a balanced economy within the Empire

Although confronted with problems of materials, labour, exchange and shipping, exporters of electrical goods and apparatus (as distinct from machinery) managed last year to send abroad about £2,000,000 more in value than 1939. The total was within £200,000 of the highest of the past five years and about the average over that period. The task of maintaining the level of these exports as a whole was the greater because countries now rendered inaccessible by the war were formerly fairly good customers.

For example, France had been a buyer of British cable, radio parts and telegraph and telephone apparatus ; Holland, of cable, accumulators and insulating materials ; Belgium, of radio parts and telegraph and telephone apparatus ; the Scandinavian countries, of radio apparatus and accumulators ; Poland, of telegraph and telephone apparatus; and Rumania, of wire and cable ; while all the countries named figured in the trade returns as purchasers of fair quantities of unspecified electrical goods.

Importance of the Dominions

Empire markets, however, took nearly three-quarters of the total exports, with South Africa and Australia in the lead, India next and New Zealand also a good customer.

For the most recent statistical information as to the chief customer countries of the United Kingdom electrical machinery manufacturer, reference must be made to the annual statement for 1939, which was published not long ago.

Of the total value of £5,938,000 of electrical machinery exported in 1939 no less than £4,558,000 represented orders from British countries. The group showing the largest aggregate was that comprising switchgear and switchboards (other than telegraph and telephone). This was valued at £1,483,000, only £241,000 of which went to foreign destinations. Over one-third of the Empire business came from South Africa, which was the best customer, while India and Burma came next with about 25 per cent. of the total. Next in order of importance were Australia, New Zealand and Palestine, with British West Africa a good runner-up. Other customers recorded are the Straits Settlements, Southern and Northern Rhodesia, Eire, Hong-Kong and Canada.

Foreign business for the larger generators (exceeding 200 kW) absorbed about 20 per cent. of the total exports (valued at £1,184,000). There were good orders from the Soviet Union, Iran, Argentina, and Portuguese East Africa. Shipments of these generators to British countries totalled £957,000 in value, over one-third going to South Africa, about one-fifth to Australia, and nearly one-sixth to India. Canada's purchases were valued at £50,000, well up to the 1935-39 average. The British West Indies, New Zealand and British West Africa were fair customers.

Of generators not exceeding 200 kW about one-third went to foreign and two-thirds to British destinations. Egypt, Argentina, Holland, the Soviet Union and Brazil were the outstanding customers in the former category, while in the Empire India was in this case a better customer than South Africa, with Australia close behind and New Zealand and Canada also making a fair show.

Motors (other than traction), up to 250 HP, were the next largest group, and aggregated £960,000 in value, £730,000 to British and £230,000 to foreign destinations. Among the former, South Africa, India and Australia accounted for more than half the total, Palestine for £86,000, New Zealand for £46,000 and Canada for £42,000. The Gold Coast and Eire were also noteworthy customers. Foreign destinations included the Soviet Union (about 15 per cent. of the foreign total), Argentina, China, Holland and Iran.

In the next most important group, namely convertors and transformers, there was a change in the classification in 1939 and therefore the figures for that year are not strictly comparable with those for previous years. Consequently it is impossible to tell from the returns whether the great increase which took place in the export of such apparatus between 1934 and 1938 was continued. It is worth recalling that exports of static transformers rose in value from £363,000 in 1934 to £1,111,000 in 1938, and those of rotary plant from £62,000 to £104,500 in the same period. In 1939 shipments of power transformers totalled £850,000 in value, those of converting machinery £48,000, and those of rectifiers for power-house use £44,000. Only about one-eighth of this apparatus found foreign outlets, while among Empire destinations, South Africa, India and New Zealand were noteworthy.

Special mention should be made of the export trade in motors under one horse-power which have more than doubled in value since 1935, and have generally sold in foreign markets to a larger extent than in British. In 1939 the total value was £163,000, of which £97,000 went to foreign destinations, notably France (£17,600), United States (£10,600) and Argentina (£11,900). Noteworthy among Empire customers was Canada.

In at least two lines of electrical manufacture the United Kingdom carries on a growing export trade of which particulars seldom appear separately in the statistical returns. These are electric furnaces and the new forms of street and factory lighting. In both, business in the Empire has been distinctly good.

In the foregoing account of the electrical trade of the United Kingdom with the overseas Empire there is undoubtedly cause for satisfaction. But it is not enough to note whether shipments to a particular market are increasing or decreasing. In addition the exporter should examine the position in the customer country and assure himself that he is obtaining a proper share of the market and standing up to any new rivals that may be entering the field.

South Africa

Take, for example, South Africa, which is the best Dominion outlet for British electrical goods. As in other parts of the Empire control of exchange has been introduced, together with an import licensing system, but their operation is less restrictive than elsewhere.

During the last normal year of trade the share of the United Kingdom in the electrical market was 60 per cent. of the total value.

A complete lighting scheme has recently been carried out by the G.E.C. in Church Square, Pretoria

The United States competed there in a number of lines and has done more business than the United Kingdom in radio apparatus, self-contained lighting units, batteries and accumulators. In heating apparatus Canada has been gradually improving her position up to about half the total trade. Germany and Sweden have been selling more vacuum cleaners than Britain has.

South African progress in the manufacture of electrical goods has been limited. The most noteworthy effort has been in wires and cables, under the guidance of a leading United Kingdom firm.

Australia

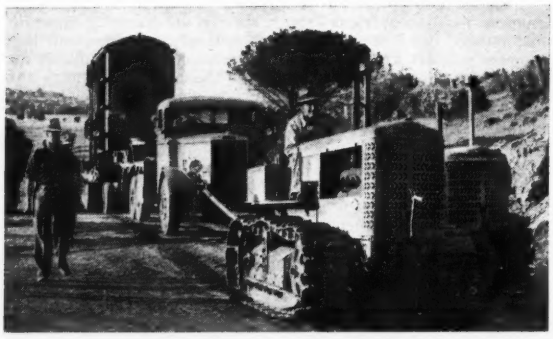
In Australia, the United Kingdom electrical exporter has for some time been meeting increasing competition from local manufacturers. Some of these enterprises are branch factories of United Kingdom concerns which have been induced, if not compelled, to

erect them by reason of Australia's strong protectionest policy. These developments have been referred to more than once in the columns of the ELECTRICAL REVIEW. The movement started with the simpler descriptions, often taking the form of assembly of imported parts, and has spread to more complicated appliances. Some 11,000 workpeople are now employed in making electrical machinery and equipment. Further advance will no doubt be made during the war period and import trade will be affected accordingly.

A good indication of the direction which this development is taking is given by the latest report of the Electrical Manufacturers' Association of New South Wales, the State where secondary industries have been most widely established. The leading line produced in 1938-39 was accumulators and batteries (£977,000), followed by regulating, starting and controlling apparatus (£462,000) transformers and convertors (£298,000), AC motors (£294,000), telegraph and telephone apparatus (£115,000), electric heating appliances (£112,000), household fittings (£51,500), DC motors, including traction (£36,400), domestic cooking appliances, excluding stoves (£32,400), and portable tools and appliances (£2,000). The total value of the production of electrical goods in the Commonwealth as a whole was just under £7,000,000.

The Standards Association of Australia has adopted wherever possible the standards for electrical goods that apply in Great Britain. Thus United Kingdom goods in many instances enjoy in the Commonwealth market an additional preference over American. Victoria, Queensland and New South Wales have their approvals regulations and South Australia is preparing the way for similar action.

During the trading year 1939-40, imports of electrical machinery and appliances into the Commonwealth were valued at £4,393,000, a decline of about £500,000 on 1938-39. Three-fifths of this decrease was accounted for by smaller sales of telephone material.



A 12,500-kVA Hackbridge transformer weighing 45 tons en route for the Goulburn substation, New South Wales

Imports of cable and wire amounted to £1,421,000, or nearly one-third of the total for the year, and showed a rise of £186,500 on 1938-39. Batteries and accumulators showed a 50 per cent. recovery to £65,300, in spite of the gradual expansion of manufacture locally.

For the current trading year (1941-42), statistics in a summarised form are available for four months, *i.e.*, July-October. They show a total value for machinery and apparatus of £1,504,000, compared with £1,401,000 in July-October, 1940. The groups which contributed to this recovery were cable and wire, lamps, and unspecified goods.

The Commonwealth Government has been obliged by considerations of shipping and exchange to restrict the import of an increasing range of goods, particularly those hitherto purchased from non-sterling areas.

New Zealand

In New Zealand, electrical importers have suggested the need for a greater degree of co-ordination between, on the one hand, the Dominions licensing system, which is designed to economise sterling and protect the local manufacturer, and on the other the United Kingdom control of exports. It is suggested that there are many lines of apparatus which could be imported into New Zealand without inconveniencing local makers and which could be supplied by the United Kingdom without interference with the war effort. Licences for the latter appear, however, to be difficult, if not impossible to obtain.

The total value of New Zealand's imports of electrical machinery and equipment last year was about £2,500,000, only a trifle lower than in 1939. In addition radio apparatus was imported to the value of £270,000 compared with £310,000.

Steady increases are recorded in the generation and consumption of electricity in the Dominion. During the last financial year (1939-40) there was a rise of 218 million kWh in energy generated, one of 19,039 in the number of retail consumers, and proportionate increases in the numbers of cookers, water heaters and electric milking machines in use. Similarly the average amount of energy sold to each customer continues to advance. The successfully operated hydro-electric undertakings have experienced some difficulty in meeting all demands during the months of peak load. The annual consumption of electricity per head of population has reached 860 kWh.

In the circumstances it is not surprising to learn that the extension of existing plants and the execution of new projects are proceeding as rapidly as conditions permit.

India

For the year 1939-40, separate figures for electrical machinery imports into India are not available. In machinery as a whole there was a decline in imports of about 25 per cent. on 1938-39. Imports of electrical goods and apparatus in that year fell by about 12 per cent. compared with 1938-39.

In the electrical apparatus trade in the latter year the United Kingdom enjoyed about five-eighths, Germany and the United States being the only considerable competitors with shares of approximately one-sixth and one-tenth respectively. In the battery trade as a whole Hong Kong has recently occupied a better position than Britain, thanks to successful competition in the flash-lamp type.

Germany, in 1938-39, increased her business in wires and cables by 50 per cent. on 1937-39, and sold about four times as much as in 1934-35, her progress being principally in insulations other than rubber. In the same year Italy enjoyed not far short of half the fan business.

In the wireless trade the United Kingdom has taken a steadily increasing part. Her imports in 1938-39 were nearly four times those in 1934-35, while Holland's sales, which had risen rapidly until 1937-38, have since fallen. American participation diminished in 1938-39.

In 1938-39 two-thirds of the trade in electrical machinery fell to the United Kingdom, with Germany taking one-sixth and the United States one-thirteenth, with Sweden and Switzerland the only other considerable competitors. Germany made a rapid advance between 1934 and 1939, her imports into India having approximately trebled in value. Those of the United Kingdom doubled during the same period, while the aggregate value of imports of this machinery from all countries rose from Rs 1,68,91,000 to Rs 3,71,92,000.

The development of electrical manufacture in India has been directed chiefly to the less complicated appliances. It includes insulated wire and cable, lamps, low-voltage insulators, lighting fittings of plastic material and fans. In Bengal there is a lamp works, started less than ten years ago, which now produces over a million lamps annually.

Canada

Many years ago British manufacturers were recommended, if they wanted to preserve their goodwill in the Canadian market, to start branch works in the Dominions and thus take advantage of the protection afforded by the Customs tariff. Not a few United Kingdom electrical manufacturers adopted this course. Already there was a large electrical manufacturing industry in Canada which was augmented by branches of American concerns, whose Dominion affiliations could benefit in their export trade by the preferential duties in force in most parts of the Empire.

The strength of local manufacture, combined with the proximity of the American producing centres, has therefore restricted the market for United Kingdom goods. Other limiting factors have been the adoption of American standards and the lack of servicing facilities for British imports.

For many years attempts have been made on behalf of United Kingdom electrical manufacturers to bring about some change in the procedure in connection with standards that would place them in a more favourable position. So far, however, it has not been found possible to arrange for the testing in the United Kingdom of all electrical apparatus intended for use in Canada.

As a result of the adoption by the Provincial Governments of the Canadian Electrical Code the use of "approved" equipment is now required throughout the Dominion. This means that equipment must be submitted for examination, test and approval to the Canadian Engineering Standards Association. The Association has issued a pamphlet setting out the procedure regarding the inspection, testing and approval of electrical equipment. It is known as the "Approvals Manual" and may be borrowed from the Department of Overseas Trade.

The Canadian Government has taken a number of wartime measures calculated to improve the prospects for the import of United Kingdom goods into the Dominion. One of the first was an exchange tax of 10 per cent. on all imports from non-Empire sources. About the same time many articles were subjected to import licences. More drastic steps to conserve exchange were taken last December when a large number of imports from non-sterling countries were prohibited, and others put into a list of imports which are to be progressively limited. At the same time, in order to check the expansion of manufacture of articles the import of which was prohibited or restricted, excise taxes were put into operation.

Export Risk Insurance

Special Wartime Facilities

By W. Piercy, C.B.E.

(Sometime Lecturer in Public Administration at the London School of Economics)

BEFORE the war the Export Credits Guarantee Department of the Board of Trade* conducted a large variety of business. It insured short-term and medium-term credit, transfer risks and default of foreign Governments. By special devices it facilitated export business to several countries where trading, for various reasons, was difficult; and it operated British Government credit or guarantee agreements with divers other countries. Day-to-day exports of textiles or hardware, and contracts for the electrification of a railway were equally grist to its mill.

The staple of the Department's peacetime business, however, was the insurance of United Kingdom exporters' credit risks overseas; and the most characteristic form of this was the insurance of "short-term" risks, that is to say, ordinary trade credit given abroad, whether by bills, or open account, or otherwise, on terms not exceeding six months with perhaps an occasional extension. Last year the Department gave guarantees amounting to upwards of £60,000,000 in respect of exports from the United Kingdom.

In the building up of this important turnover the Department had applied two basic principles. The first was to retain the exporter as a partner in the risk. Thus the cover was 75 per cent. (not 100 per cent.) of any loss, recoveries, if any, being then shared proportionately between insurer and insured. The second was to require the exporter to insure with the Department the whole of his export business. This prevented the Departments being saddled with only the dubious risks and the unsatisfactory customers. The effect of these twin principles, coupled with the Department's unrivalled facilities for obtaining information about overseas buyers and conditions in foreign countries, enabled it to quote rates which were very low and which were not felt to be a burden by policy holders. The Department set out to work on a self-supporting basis covering, by its premium income, the outgo on claims and its administrative expenses. The small reserve accumulated in respect of the Department's short-term business was rapidly used up and exceeded when claims arising from war conditions had to be met.

Necessary as it was before the war, the insurance of export credit risks is now even more essential. This article describes briefly the services offered by the Export Credits Guarantee Department of the Board of Trade

For some time before the war the hindrances and delays in the remittance of funds from foreign countries had become a definite risk; the exporter with a perfectly solvent buyer abroad might yet experience delay in the receipt of payment in sterling. To meet this situation, exporters who had insured the whole of their export turnover with the Export Credits Guarantee Department were enabled, by an addendum to their policy, to take out "transfer cover" for particular countries. Here, where the element mainly concerned in the risk was *force majeure*—outside the trader's control—the percentage of cover given was also 75 per cent. until some months after the outbreak of war when it was increased to 90 per cent.

Under war conditions the Department has added to its primary function of insuring British exporters' credit risks overseas, the insurance of those war risks necessarily associated with export business which are not insurable with other agencies. Just as marine war-risk insurance makes its appearance in wartime parallel with the insurance of normal marine risks on cargoes and hulls, so the insurance of credit risks in wartime must be reinforced by the insurance of those risks (not covered by other agencies) which may make it impossible for the overseas buyer, not merely to transfer sterling, but perhaps even to pay at all, or may make it impossible for him to accept delivery of the goods which the exporter has manufactured to order and prepared for shipment.

All-in War Emergency Policy

The completest form of this protection is given by the All-in War Emergency Policy introduced in September, 1940. This policy is issued to any exporter who is prepared to insure with the Department the whole of his export orders, for all countries. It covers against losses on contracts sustained by reason of:

(*a*) The exporter being prevented from delivering the goods by any cause not within his control—and not excluded by the policy, or

(*b*) The buyer being prevented by his insolvency or by any cause not within his control from paying to the exporter the price of the goods in sterling or such other currency (being a currency approved by the Department) as the contract specifies.

The causes which are excluded by the policy are mainly:

(*a*) The insolvency of the exporter,

(*b*) Acts of war operative within the United Kingdom, and strikes, lock-outs or civil commotion taking place within the United Kingdom, and

(*c*) The enactment of any Statute or the making of any Statutory Rule or Order or the giving of any general directions thereunder preventing or restricting the manufacture of the goods in the United Kingdom or their export therefrom.

Over and above these exclusions it is provided that the guarantee shall not, in respect of any contract, apply to a loss due to any risk which, at the date when the contract is made, the exporter is by law bound to insure, or which at the same date can be, and normally is, insured through or with any other Government Department or at Lloyd's or with commercial insurers. The policy was drafted in this general way so as to assure the exporter that by this policy, taken in conjunction with marine insurance, Government war risks insurance, and any other insurances which he takes out in the ordinary course of his business, he shall be covered, to quote the then President of the Board of Trade, "for all major risks from the placing of a contract to the receipt of the purchase price in sterling."

What the exporter gets, broadly, under the policy is insurance of:

(1) The credit risk;

(2) The risk of delay or hindrance in in the making of payment in sterling by reason of exchange restrictions, etc.;

(3) Risk of war invasion in the buyer's country preventing the delivery of the goods shipped, or the payment for these being duly made or transferred;

(4) Risk of war, etc., outside the United Kingdom, or conditions in the buyer's country, making it impossible to ship goods which have been manufactured for export; and in addition, cover for:

(5) Any expenses, not covered by marine policies or Government war risks policies, caused by interruption or diversion (through British Government instructions) of the voyage on which goods are shipped.

The percentage of cover in the case of losses due simply to the insolvency of the overseas buyer is 85 per cent.; in the case of losses arising under all other heads, it is 90 per cent.; and the policy contains provision for determining the loss within a reasonable limit of time, usually six months, and making payment promptly thereafter.

Simple Procedure

The procedure of the policy is simple. The exporter makes a monthly declaration of the orders he has booked and the cover becomes effective as from the date of the order. The policy applies to contracts where shipment is to be made within six months and the credit terms do not go beyond the limits specified in the policy for particular countries (usually six months as a maximum with one renewal of 90 days). The amount eligible on particular buyers is settled by the usual machinery. The Department fixes a "non-vetting" limit up to which the exporter can give credit at his own discretion where he is satisfied as to the soundness of the buyer. For larger amounts the Department will fix a limit for the individual buyer. These limits, known as credit limits, define the amount outstanding at any time in respect of goods delivered for which the Department will accept liability under the policy.

Corresponding to these limits is the contract limit, which is the amount which the Department is prepared to take on risk under the policy in the way of contracts for goods not yet delivered. This is, for each buyer, four times the credit limit for that buyer. The sum of the outstandings under the credit limit and the contract limit define the Department's risk on transactions with a particular buyer at any one time.

The premiums for this policy are quoted in the form of a scale

* The Department's headquarters is at 9 Clements Lane, London, E.C.4, and it has branches in London (Bush House), Manchester, Bradford, Birmingham, Sheffield, Newcastle-upon-Tyne, Glasgow and Belfast.

of rates varying for different countries; and rates are stated in the policy for all the countries with which the exporter trades. They are fixed separately for each policy according to the nature of the business carried on—the industry, the credit terms, etc.—but it may safely be said that they are in all cases very moderate. If at any time an alteration in rates for particular countries becomes necessary, the exporter is protected at the old rates as regards all business already booked. Exporters holding the older range of policies issued by the Export Credits Guarantee Department, such as the Comprehensive Guarantee, the Transfer Addendum and Pre-shipment Policies, are enabled to replace these by the new All-in Policy if they so desire.

The "C.i.f. Charges" Policy

Another important wartime facility which has been introduced by the Department is the "C.i.f. Charges" Policy. This aims at relieving the exporter of the whole of any increase in c.i.f. charges arising from increases in the rates of freight, of marine insurance, or Government War Risk Insurance premium, between the time of accepting an order and shipping it. The exporter is thereby enabled to conclude with his overseas buyer on a price which shall be free from variation from this cause. This, in the great majority of export trades, enables the exporter to quote a firm c.i.f. price; and even where clauses providing for increases in the cost of labour and materials remain in the contract, one chief source of variation is nevertheless removed; and the agreements made in some trades after the outbreak of war, to quote only on f.o.b. terms because of this risk, are no longer necessary.

The policy covers the exporter for all increases which may take place during a period of six months from the date of the contract. In special cases, some extension of the period can be arranged, by paying additional premium. The standard rates of premium are: 2½ per cent. of the total estimated amount of the c.i.f. charges where the exporter is shipping to several markets and undertakes to insure during a period of six months the whole of his c.i.f. contracts with the Department; 4 per cent. where the exporter undertakes to insure the whole of his c.i.f. contracts to a particular specified market or markets; and 5 per cent. where it is desired merely to insure the risk on a specific contract. This facility has proved to be perhaps the most popular of the Department's recent introductions.

Other Standard Facilities

Some of the Department's standard policies should be mentioned here for the sake of completeness. They are:

(1) **The Comprehensive Guarantee.** This is the policy under which the Department for many years now has undertaken to insure the overseas credit risks of the British exporters, on the footing of the exporter insuring the whole of his shipments abroad (the so-called "comprehensive" basis). Its technique forms the basis of the new All-in Policy; but the Comprehensive Guarantee itself is purely a credit insurance policy and it insures shipments actually made, not contracts booked. At the present time many exporters hold it in conjunction with one or both of those now to be mentioned.

(2) **The Transfer Addendum** to the Comprehensive Guarantee, originally introduced in 1935, was modified in May, 1940, to meet war conditions. It covers the holder of a Comprehensive Guarantee for transfer (including catastrophe) risks on shipments to particular countries at his choice. It was by virtue of this Addendum that exporters were able to make claims on the Department in respect of heavy losses incurred before and since the outbreak of war on exports to European countries. Very large sums have been paid under this heading in the past year.

(3) **The Pre-shipment Policy,** introduced in August, 1940, was the first policy to enable the exporter to insure, for a moderate premium, against the risk of loss due to manufacturing goods and not being able to ship them to the buyer owing to war, invasion and the like in the buyer's country, or the introduction there of exchange and trade restrictions precluding the execution of the contract. It also covers expenses arising out of frustration of shipment in certain cases. This policy is also on a comprehensive basis, that is to say the exporter is required to insure thereunder the whole of his export contracts. This is a necessary condition for enabling the Department to quote, as it does, an extremely low rate of premium. This policy is issued either with, or independently of, the Comprehensive Guarantee.

Though the All-in Policy in a simple document gives all the cover afforded by a combination of these policies, some exporters find that a combination of some one or two of these facilities suffices for their particular requirements and they are all still in issue.

Credits to Overseas Purchasers

Guarantees by the Department in respect of medium-term credits (from one to three years), transfer risk and, in some cases, pre-shipment risks, in connection with credits to overseas purchasers of plant and machinery have long been a keenly appreciated and well-used facility. The war has brought many difficulties, *e.g.*, supply (raw materials) and productive capacity (man-power), in addition to a necessary curtailment of terms of payment which, in more normal times, would have proved acceptable. Manufacturers are bound to recognise that sales on long credit involving as well, in most cases, considerable periods for manufacturing and for installation, can be of no immediate assistance to the economic effort of the war. But, on a long view, maintenance of the country's exports of capital goods is highly important and in the post-war situation may be more important than ever. In such cases, therefore, where the supply position is not impossible, and export licences are forthcoming, manufacturers would be well advised to communicate with the Department as guarantee and other facilities are still available in suitable cases.

Meter Certification

Wartime Relaxation of Regulations

IN our issue of January 17th, Mr. S. H. Richards, chief meter examiner to the Electricity Commissioners, reviewed the situation with regard to the certification of electricity meters from the inception of the new practice under the Electricity Supply (Meters) Act of 1936 to the present time, paying special regard to the relaxations necessitated by war conditions.

The Commissioners have now made a statement on the subject in which they state that of their own staff of examiners over 75 per cent. have been seconded to various Government Departments and are engaged on work suitable to their special training and qualifications. The Commissioners estimate that the industry has released at least 60 per cent. of its testing and repairing personnel and is carrying on with a minimum staff for the testing and certification of meters in addition to other testing required.

Apart from the reduction in meters being tested (about 33⅓ per cent. of normal) release of men has been made possible by the following modifications which have been made by the Commissioners :—

(1) In methods of testing standard and sub-standard instruments.

(2) By releasing undertakings from the obligation of the periodical return of standards to the N.P.L. for test, particularly the potentiometer equipment.

(3) By allowing the cross check of "suspect" standard apparatus of one undertaking by means of the apparatus used by other undertakings.

(4) By permitting tests to be taken for meter certification at a tenth load instead of a twentieth, in order to allow of a larger number of older meters being used during the war.

(5) By arranging for testing and certification at manufacturers' test rooms for the duration of the war.

(6) By arrangements whereby the visits of examiners for certification are considerably reduced.

While many undertakings have combined for certain work, in the majority of cases undertakings are still carrying on as far as possible in their own test rooms. The arrangements so far concluded have worked satisfactorily, but the Electricity Commissioners visualise the possibility of a reduction in the number of test rooms as and when the calling up of men makes it impossible for any test room to carry on. Consideration has been given to the possibility of concentrating testing in central testing stations surrounded by smaller undertakings incapable of carrying on with the work, and schemes have been prepared and can be put into force at short notice should further difficulties arise.

The Commissioners feel that certain routine testing could be carried out by suitable female labour. In at least one case, that of the Stalybridge, Hyde, Mossley and Dukinfield Transport and Electricity Board, women have regularly been employed on this work, even in peacetime.

The scheme at present in force and the suggested action for the future have been formulated because by far the larger proportion of the undertakings in this country (approximately 98 per cent.) have indicated to the examining staff that they consider it essential that meters should be tested (apart from any question of certification) in the interests of undertakings and consumers alike and particularly now that so many old meters have to be overhauled and re-used.

In view of the difficulty in obtaining supplies of replacement jewels, and to a lesser extent of pivots, for existing meters, consideration is being given to the possibility of re-using old jewels and pivots, by cleaning, lubricating and repolishing the jewels and reconditioning the pivots.

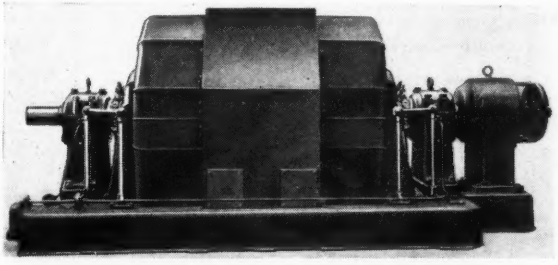
Recent Export Orders

Types of Electrical Equipment in Demand

ALTHOUGH export is one of the least spectacular of our war weapons, it has been, and still is, making a very substantial contribution towards the national effort. In this the electrical industry is playing a very important part and sending its products in large quantities to all parts of the world. An indication of the extent and variety of these exports is given by the following notes of recent activities of individual manufacturers, whose achievements in maintaining and often increasing their shipments abroad under difficulties provide convincing evidence of Great Britain's ability to " deliver the goods."

A heartening and significant fact at the present time is the sustained demand from overseas for generating plant, mercury arc rectifiers, transformers, switchgear and motors which reveal unmistakable the confidence placed in British-built machinery. Typical of this is the success achieved by Bruce Peebles & Co., Ltd., in extending their connections in all parts of the world. Generally similar to units of varying outputs supplied or on order for municipal undertakings and mining companies in South Africa, Australia and South America, a duct-ventilated type geared turbo-alternator supplied to a public authority in South Africa is designed to give a continuous output of 2,000kW at 0.75 power factor (3-phase, 50-cycles, 11 kV) operating at 1,500 RPM. The set is self-contained with direct-coupled exciter, two ring lubricated pedestal bearings arranged to take a refresher feed of low pressure oil from the lubricating system of of the turbine, and the bedplate is faced for bolting to the gear-case bedplate. In construction of the alternator fabrication from structural steel with the aid of cutting and welding equipment, was adopted to the maximum extent. This resulted in important savings in the cost of production, economy in materials and shorter manufacturing time when compared with castings for the same purpose.

Loading G.E.C. goods for overseas



Bruce Peebles duct-ventilated type geared turbo-alternator for South Africa

A Crossley Premier-Bruce Peebles oil-engine driven generator set built for a mining company in West Africa is of unusual interest. It is designed for an output of 460 kW at 0.8 power factor and delivers 3-phase, 50-cycle current at a pressure of 525 V at 214 RPM. The alternator is situated between two groups of six cylinders, the rotor being bolted on to the flywheel and the exciter direct-coupled to the crankshaft. The flywheel is provided with six arms which carry machined faces to which the brackets supporting the alternator rotor are bolted. The slip rings are mounted on a sleeve keyed to the crankshaft and the stator frame is split along the horizontal diameter to facilitate erection.

In many industrial applications the use of DC is essential—for instance, in steelworks, paper mill and printing works drives; for electrolytic and plating plants; for cranes, hoists, etc. Among motor convertors sent abroad by Bruce Peebles are two for India, one a 1,500-kW, 6,000-A, 250-V, 300-RPM unit for operating on a 3-phase, 50-cycle, 6,300-V circuit for a steelworks and the other a 300-kW, 520/575-V, 1,500-RPM tap-starting rotary convertor set for an electric traction company.

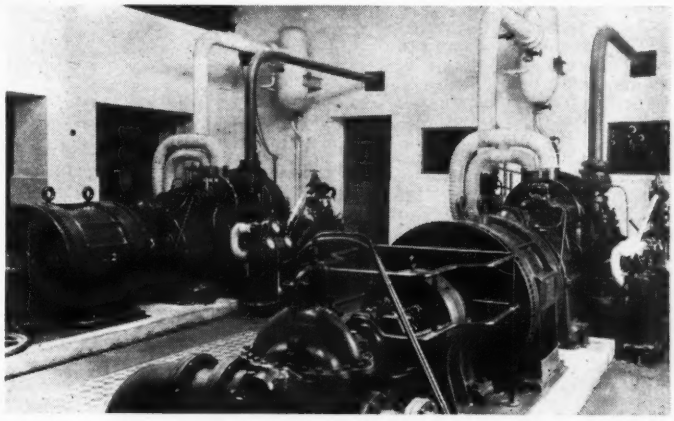
The " self-contained " type of turbo-alternator made by the Metropolitan-Vickers Electrical Co., Ltd., for requirements up to 6,000 kW, finds increasing favour abroad. This set incorporates the condenser with the turbine and its single reduction gear in a compact unit, economising in space and foundations. For many uses the " pass-out " pattern is adopted with excellent results. In a self-contained set for a soap works in Turkey two 437-kW, 6,000-RPM turbines drive 625-kVA, 380-V, 1,000-RPM alternators.

The British Thomson-Houston Co., Ltd. has supplied recently a 10,000-kW turbo-alternator for the high-pressure extension of the Delray power station of the Detroit Edison Company.

This machine operates on steam at 815 lb. per sq. in., 900 deg. F. total temperature and exhausts against a gauge pressure of 410 lb. per sq. in. Other B.T.H. turbo-alternator orders include a 12,500-kW machine for the Bringson power station at Kuala Lumpur, Federated Malay States, and two 4,000-kW geared turbo-alternators installed in the power station of the New Kleinfontein Co., South Africa. The turbines of the latter are 12-stage condensing units running at 4,500 RPM, while the alternators are 25-cycle machines which operate at 750 RPM.

The popularity of the " Brush-Ljungstrom" turbo-alternator sets is borne out by repeat orders, and a typical instance is a 7,500-kW turbine recently installed in a Dominion power station which already has four similar sets. This turbine is designed for a most economical load of 6,000 kW with steam conditions of 200 lb. per sq. in. and 700 deg. F. and has also been designed for conversion at a later date to render it suitable for 400 lb. per sq. in. and 800 deg. F., with feed heating up to 280 deg. F. Acceptance tests have been completed and a repeat order has been received for a further similar set. The company has received orders for a number of 100-kW alternators for Government service in Australia and also for a large convertor for a tube factory in the same Dominion. Orders have also been received for 115 small induction motors and starters for India and Malaya, and South American orders include various small engine-driven alternator sets with associated switchgear.

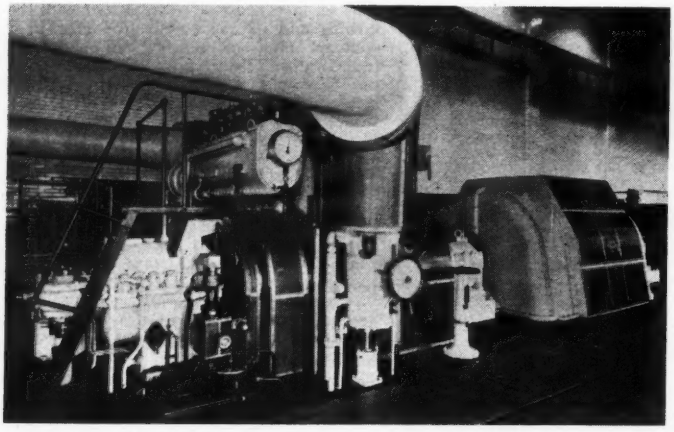
One of the most important contracts carried out recently for generating equipment has been in connection with the Waitaki power station of the Public Works Department, New Zealand, and we illustrate one of the 16,674-kVA, 125-RPM umbrella-type water-turbine turbine-driven alternators erected at the English Electric Company's works before despatch. The 23,000-HP vertical shaft reactor water turbines have also been manufactured by the



Two self-contained turbo-alternators provided by the Metropolitan-Vickers Co. for a Turkish soap works

same company. South Africa, too, has called for three 40,000-kW, 3,000-RPM turbo-alternators for the Table Bay power station at Cape Town. These have been supplied by C. A. Parsons & Co., who have also recently supplied and installed a 3,125-kW pass-out turbo-geared alternator for the works of the Goodyear Tyre and Rubber Co. of Canada, Ltd., in Canada.

A DC generator to be driven by a Fraser & Chalmers oil engine, and a large alternator are examples of repeat orders from Macao. Orders have been received recently by W. H. Allen, Sons & Co., Ltd., from places as widespread as Iceland, Canada, Portugal, Nigeria, South Africa, Egypt, Turkey, Iraq, India, China and Australia for generating plant for power stations, waterworks,



B.T.H. 10,000-kW topping turbo-alternator at the Delray station of the Detroit Edison Electric Co., U.S.A.

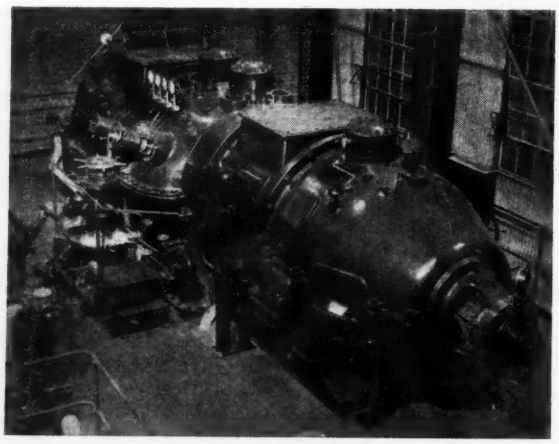
oil refineries, sugar mills, chemical works, etc. Among them is one for two 1,500-kW geared pass-out turbines for a canned meat factory in Sao Paulo, Brazil, having a conversion efficiency of over 90 per cent. This satisfactory result has been achieved by generating heating steam at a pressure of 250 lb. per sq. in. gauge, 558 deg. F., and passing it through a turbine as a reducing valve.

In the case of the pass-out turbines mentioned, the maximum process steam quantity is 36,000 lb. per hour at 55 lb. per sq. in. gauge, which will yield something in the neighbourhood of 900 kW. The remaining 600 kW is obtained by passing steam through the low pressure stages of the turbine and exhausting it to a condenser at 27½ in. Hg. vacuum. Furthermore, as the process steam quantity is liable to fluctuation, the condenser is actually designed to condense 17,800 lb. of steam per hour, which represents about 12,000 kW when no pass-out steam is withdrawn.

The turbines run at 7,000 RPM, while the alternators are designed for 1,200 RPM. Each set is provided with a surface condenser of the Allen "Awlinwun" type in which the surface condenser shell is suitably designed to act as the turbine base plate, making it thus possible for the whole of the plant to be mounted on a single floor level. A further 1,500-kW pass-out turbo-alternator has recently been shipped to the same customers for use in Australia, where it will be erected beside two 850-kW Allen turbo-alternators of similar type installed in 1936.

In spite of the very heavy home demands, Lancashire Dynamo & Crypto, Ltd., have found it possible to supply equipment to overseas markets to an increasing extent. Numerous orders have been executed in connection with municipal and private generating plant for both AC and DC supplies, and a typical example is that of a municipal power station which was opened last year in Western Australia. In the illustration of the interior (page 591) the two nearest units are Lancashire-Crypto 212-kW generators driven by 330-BHP Ruston six-cylinder engines, while behind these are two 104-kW generators driven by 165-BHP three-cylinder engines. All the generators are of the single-bearing type rigidly coupled to the engine flywheels and run at 428 RPM. The engines have a bore and stroke of 11 inches and 14½ inches respectively and are of the totally enclosed forced lubricated type. The main supply is 480 V and for lighting purposes a 180-A Lancashire rotary balancer was installed.

In addition, to meet the demand for AC, two motor-alternator sets were supplied, each running at 1,200 RPM. One set comprises a 28-BHP DC motor direct-coupled to a 22-kVA alternator and the other a 50-BHP motor coupled to a 40-kVA alternator, the output being 440/254 V, 40 cycles. The sets are mounted on combination base plates and have level voltage characteristics over the full load range.



A 7,500-kW Brush-Ljungstrom turbine recently installed in a Dominion power station

Motors

The demand for motors for export has reached considerable proportions, but the buyer is no longer satisfied with standard types only. The war has rendered many of the Continental and American motors of special types unobtainable. Brook Motors have developed this demand to the full and are now exporting over 2,000 a month. Two special types are in great demand. The flameproof motors are mass produced and cost only a little more than the normal totally enclosed machines, while a motorised siren offered complete is rated at 6 HP and has twin "voices." Special motors have also been made for flexible grinder drives, food mincing machinery and woodworking, and a new range of fractional-HP AC motors has been introduced at low prices. The company's range of motors covers any AC applications between ¼ and 250 HP.

For forty years Bull Motors have specialised in the manufacture of quiet running electric motors. Machines of this kind are in almost continuous use all over the world, driving hot-water circulating pumps, ventilating fans, refrigerating equipment, etc. Recently special attention has been paid to the design of silent running lift motors and the Bull "Super Tandem" lift motor has been introduced, and many machines of this type have been built for export. The company is still able to offer good deliveries—in many instances from stock.

One of the most important advantages of the Laurence, Scott & Electromotors "N-S" variable speed AC commutator motors is their excellent commutation, resulting in a minimum of maintenance troubles. The driving of ventilating fans is one of the applications for which they have been used in India. Another L.S.E. product of interest to the export market is a small endshield-type alternator. The arrangement of the exciter mounted on the alternator frame and belt drive saves a considerable amount of floor space compared with the usual direct-coupled or overhung exciter and also allows a standard speed DC generator to be used. The type of belt drive is very efficient and reliable and provision is made for belt tension adjustment. Several orders from abroad for the L.S.E. electric trawl winches have also been completed during the war, the most recent being for two 4-ton, 220-ft. per minute machines for Portugal. In the design of these every allowance has been made for the severe conditions of service including their operation by unskilled labour.

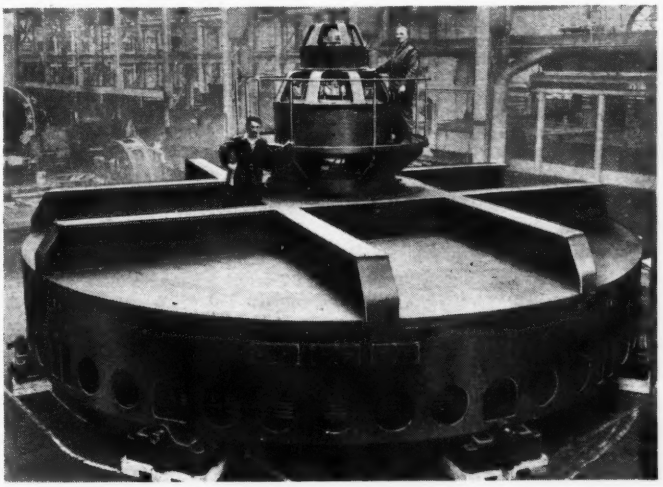
During the past year Lancashire Dynamo & Crypto have shipped to Australia hose-proof motors for newsprint mills and auxiliary motors for boiler house equipment. Other orders have included motors for tea and rubber factories and also crane motors for South American railways. South African orders have included over 100 Lancashire-Crypto all-steel scraper haulage motors and numerous machines for various types of colliery duty.

All the orders being accepted by Newman Motors are for their standard motors of the totally enclosed, fan-cooled type. This form of enclosure is very suitable for tropical climates where the ordinary protected winding is liable to be damaged by dust or sand, and also by excessive humidity. The inclusion of mica slot insulation, and the exclusion of any form of insulation having hygroscopic qualities has virtually eliminated insulation failures even under the most unfavourable conditions. In a number of instances the company has printed special lists showing prices in local currency and weights and measurements in metric units.

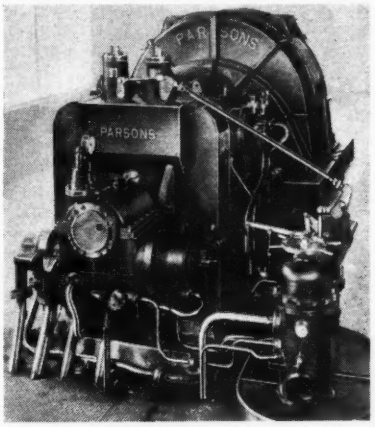
The war has led to the expansion of textile industries abroad. In this development Crompton Parkinson have played an important part in the supply of electrical equipment, and their motors,

already used extensively for such purposes in this country and abroad, have recently been supplied in large numbers to textile mills in India, Egypt, Turkey and elsewhere. Many such plants can, of course, operate on public supplies, but others have created demands for self-contained generating sets, and a large number of Crompton Parkinson alternators have been supplied in conjunction with engines of various makes. The advantages of combining power-factor improvement with extension of driving capacity have not been overlooked and in addition to the considerable quantity of standard induction motors the company has executed several orders for auto-synchronous motors.

One of two B.T.H. Ward-Leonard Ilgner winding equipments commissioned in South Africa during 1940 is a double cylindro-conical drum unit, the drums of which, 36 ft. on the large diameter, are believed to be the largest yet supplied for electric winders. Each winder is driven by a 2,938/7,345-HP, 200-RPM motor and the electrical equipment incorporates the B.T.H. patented scheme of controlled emergency regenerative braking and a commutator-type slip regulator. Each motor-generator set includes a 40-ton single-piece cast-steel flywheel for equalisation purposes. G.E.C. orders for winding equipment include a 2,140/5,350-kW Ward-Leonard driven DC motor for the Crown mines, South Africa.



English Electric 16,674-kVA water-turbine driven alternator for the Waitaki power station awaiting despatch



Parsons 3,125-kW pass-out geared turbo-alternator installed at the works of the Goodyear Tyre & Rubber Co. of Canada

Switchgear manufacturers all seem to be particularly busy on orders for overseas. The G.E.C. has considerable schemes in hand for a large industrial concern in Turkey, for a South African municipality and for railways in India and South America, the last-named consisting of an extension of an existing contract. Recent orders received by Erskine Heap & Co. comprise both high- and low-voltage switchgear, oil-immersed and air-break motor starting and control gear, flameproof switchgear and starting gear, isolating links and instruments, the chief markets being South Africa, India, Ceylon, Strait Settlements, Argentina and Brazil.

Among the orders of particular interest is a 1,000-V flameproof direct-on starter supplied in large quantities for Argentina. This replaces switches previously supplied by Germany and Holland at competitive prices. Recently the company has supplied an industrial type ironclad 3,300-V substation switchboard for a scheme in Ceylon; an 11,000-V, 100,000-kVA rupturing capacity switchboard of the air-insulated vertical draw-out pattern for the Grahamstown power station, South Africa; and a flameproof Buxton-tested switchboard for a large oil company in the Near East.

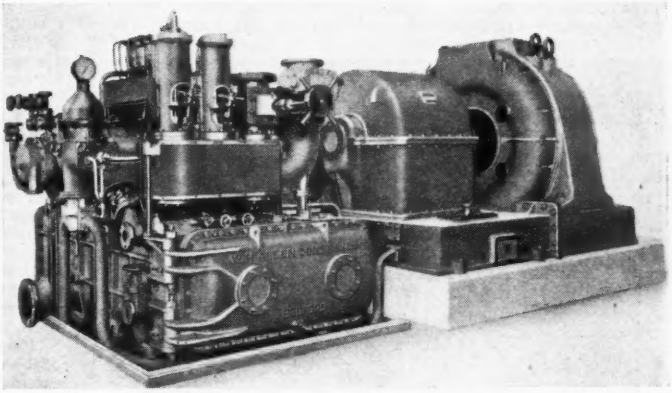
Several hundred oil circuit-breakers of special design have been supplied by Ferguson, Pailin, Ltd., to an important industrial concern in South Africa for substation work. The equipment is for installation in masonry cells and for use under severe climatic conditions on a 20-kV, 3-phase, 50-cycle system, but fully insulated for 33 kV. Their outstanding feature is that they combine compactness with a tested breaking capacity of 500 mVA at 20 kV, the necessary clearances for 33 kV, and facilities for the simple replacement of any part subject to wear and tear. Both solenoid and spring closing types of operating mechanism have been supplied and these are readily interchangeable.

A large number of metalclad oil and compound filled switchboards has been supplied by the same company for service in important distribution centres of electricity supply undertakings in Brazil. Special requirements have been met by distinctive designs. The system voltages are 3.8 kV and 11 kV, and as the breaking capacity rating at the lower voltage is 250 mVA, special features have been incorporated. The illustration on page 591 shows part of a large installation consisting of metalclad oil and compound filled units of the vertical isolation duplicate busbar type employing two independent breakers per unit in the back-to-back arrangement. This permits " on load " busbar selection and ensures continuity of supply by duplicating the breaker portion of the feeder.

A two-panel switchboard has recently been shipped to China by the Brush Electrical Engineering Co., and the " V.A.5 " cubicle is becoming popular abroad, a large order having been received from South Africa. Switchgear supplied regularly by Bill Switchgear, Ltd., for commercial factory and domestic premises includes " Bill " arc damping cut-outs from 15 to 300 A; " Insulok " insulated switch fuses; cooker switches; " Vertex " ironclad distribution boards; " Invicta," " Royal " and " Super K " switch fuses; " Super K " heavy switches up to 400 A; and " Hingeless " teak fuseboards.

Typical of equipment supplied to overseas markets by A. Reyrolle & Co. are a 6-panel type " H.H." low-voltage metalclad switchboard suitable for use on 3-phase, 4-wire systems up to 660 V for a municipal electricity undertaking in New South Wales; and a 14-panel type " C.3 " high-voltage metalclad duplicate busbar switchboard with electrically-operated circuit-breakers and hand-operated oil-immersed busbar selector switches for an electricity undertaking in South America. The former equipment is of the air-insulated type, each panel comprising a switch and fuse unit complete with h.r.c. cartridge fuses, while the latter have a breaking capacity of 150 mVA at 6,500 V; the equipment is insulated for 11,000 V.

A multi-motor panel forming part of the control gear supplied by the Igranic Electric Co. to the Karabuk Iron and Steel Works, Turkey, contains the controls for a three-high, 28-in. mill for the tilting and travelling tables. The panels are of the back-to-back type and the main starting resistances are mounted on tie-bars



W. H. Allen turbo-alternator set with " Awlinwun " surface condenser and auxiliaries as supplied to Brazilian and Australian canned meat factories

between the front and rear panels, fireproof cable being used for the connections. Just prior to the Russo-Finnish conflict a 135/60-HP, 400-V, DC Igranic switchboard panel was installed at the Kymmene paper mills, Finland; a duplicate of this equipment is also installed at the Laskala Paper Mills, Finland. This panel contains the controls for the complete paper-making machinery from the couch, through the presses to the dryers, calenders and the reel. The controls are arranged for group acceleration, whereby the same accelerating contactors are used for those motors of the same HP, means being provided to prevent simultaneous operation. A similar panel, but totally enclosed, installed at Titaghur, India, controls the mill section drives, and individual contactors are provided for each section. Considerable quantities of Igranic equipment have been exported during the past year to New Zealand, South Africa, Australia and India.

Brook flameproof motor

Included among the many countries to which J. G. Statter & Co. have shipped considerable quantities of switchgear are South Africa, New Zealand, Canada, Brazil, Malta, Straits Settlements, India, British West Indies, etc. Considerable orders are still in hand for export. Among the extensive range of switchgear manufactured by this company certain types have been found to be the most popular for shipment overseas. An example is the e.h.v. metalclad draw-out oil and compound filled switchgear manufactured in single and duplicate busbar types and for use on systems up to and including 22 kV. A typical switchboard of this type has recently been supplied to the Public Works Department, New Zealand. Many orders have also been received for e.h.v. metalclad, air-insulated, drop-down units which are manufactured for use on systems up to 11 kVA and 250 mVA rupturing capacity.

In addition a large number of orders have been received for industrial ironclad oil-immersed circuit-breakers of the non-draw-out type and industrial ironclad draw-out switchboards, vertical and horizontal. Orders received for air-break circuit-breakers call for both ironclad and open types. Many 2,000-A and 3,000-A triple-pole air-break circuit-breakers arranged for back-of-board mounting with front of panel operation have been supplied to Brazil to replace equipment previously imported from Germany.

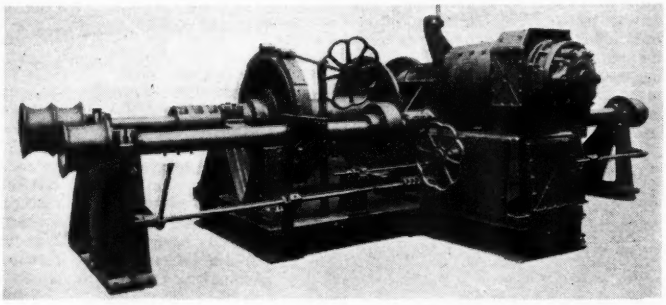
The development of the Crompton " KLAD " range of switchgear, although undertaken in the normal course of design, has proved of great benefit in dealing with the many electrical installations urgently required in connection with increased production, and many of this and other types manufactured by Crompton Parkinson have been shipped overseas.

For a tea factory in India the Donovan Electrical Co. is just putting through a large number of ironclad switchboards giving control of a group of motors in each room from an ironclad distribution switchboard. The particular board illustrated on page 593 is for a group of motors in the sifting room, for tea cutting, grinding, sifting, sorting, packing and dust removal; they are all small s.c. motors. Similar boards are being built for the rolling room, drying room, etc. A somewhat similar set of equipment, including the more usual type of frame pattern switchboard with switches, switch-fuses and meters only, is being supplied for the control of the power distribution in a municipal building in Malaya.

There is still a demand for modern breakers tested in accordance with the 1937 edition of B.S.116 which can be substituted in existing cells replacing breakers, the ratings of which are inadequate to meet the more arduous service conditions due to the increase in system capacity. The Metrovick " K 4 C " type circuit-breaker, for example, for use on systems up to 20 kV has been designed to replace out-of-date breakers within the space already provided. On the high-voltage side for outdoor service a considerable export demand has been met by the Metropolitan-Vickers Co. Typical of this equipment is a 110-kV, 1,000-mVA outdoor oil circuit-breaker supplied to New Zealand. A B.T.H. switchgear contract for the Sydney County Council's Bunnerong power station, covered twenty-six class " N.F.39," and twelve class " N.F.29 " metalclad, 33-kV draw-out equipments. The two classes of gear are similar, the larger having an interrupting capacity of 1,500 mVA and the smaller 750 mVA.

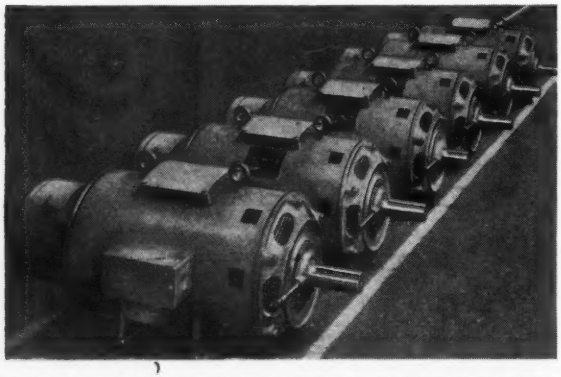
The " IVI " type of switchgear supplied by the Yorkshire Switchgear and Engineering Co. has many points of advantage. It embodies the principle of inverted vertical isolation and possesses simple and original provision for oil circuit-breaker inspection and tank removal, giving a high degree of accessibility to component parts.

Control gear and motor-starters are a speciality of M. & C. Switchgear, Ltd., supplied in considerable quantities to customers abroad. To Australia have gone recently Buxton-certified oil-immersed circuit-breaker boards for service on 3,300-V AC supply, and comprising four 200-A panels, while South African purchasers have taken four hose-proof starting control boards for the control of screening and washing plant. The latter are for service in an exposed situation and each comprises one 200-A triple-pole oil circuit-breaker incoming panel, fitted with leakage protection, two star-delta and two stator-rotor contactor-operated starters.



Several orders for Laurence, Scott trawl winches have been completed during the war, the most recent being two required for Portugal

Due largely to the virtual elimination from the market of similar German-produced units, a very heavy demand from overseas (largely for replacements) is reported by Siemens Electric Lamps & Supplies for their " Zed " h.r.c. fuses. The British-made article is in most cases interchangeable with that previously supplied by Continental manufacturers. In particular the company, since the outbreak of war, has been manufacturing and supplying large quantities abroad of the " NUZ " and " TDZ " types. The latter is a fuse of the standard " Zed " form, but wired with a special element having time-lag characteristics. It is particularly suitable for motor control gear, etc.



Part of an order for Bull " Super Tandem " lift motors built for export

Transformers

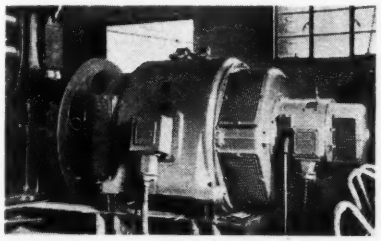
Transformers are high up on the list of electrical plant in demand overseas. Bruce Peebles report important orders for all types of transformers from the pole-mounting type up to the largest sizes and for the highest voltages in use. A typical unit of the power group much in demand is a 6,000-kVA, 3-phase, 21,000/6,600-V transformer supplied to an electric power board in New Zealand. It is provided with on-load tap-changing gear, oil conservator, and detachable radiators.

Among transformer orders received by the G.E.C. from all parts of the world may be mentioned seven 5,000-kVA single-phase units to form two 15,000-kVA, 110/11-kV banks for Tasmania. Single-phase units with on-load switchgear to form four 5,000-kVA, 55/11-kV banks for New Zealand were also put in hand as an extension of a previous order.

Continuing the successful range of transformers filled with non-inflammable liquid already supplied to South Africa, further orders were received for two 1,250-kVA and two 1,000-kVA transformers, as well as for several smaller units. These were specially designed

for transport on their sides through restricted mine galleries. Two 2,500-kVA similar units for use underground in very high ambient temperatures were designed for water cooling by internal cooling coil so as to minimise their dimensions. From Canada orders for 4,000-and 4,500-kVA fully-automatic voltage regulator transformers were received. These units, for 12-kV and 23-kV circuits respectively, are provided with motor-operated on-load tap-changers actuated from compounded relay control circuits. Large orders have been received from India for power transformers, while orders from China, Singapore, South America, Palestine, Egypt, Greece, etc., indicate the widespread nature of the demand.

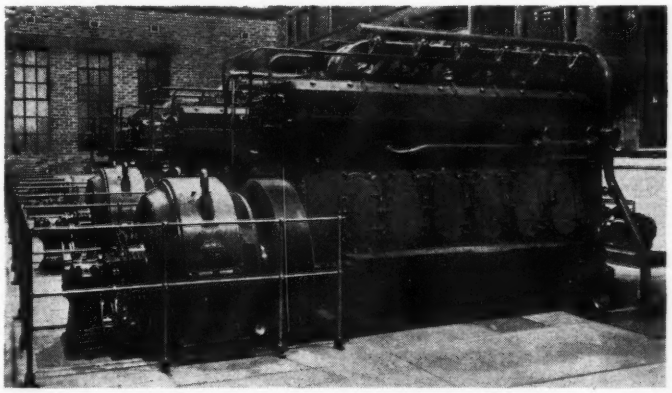
The Brush Electrical Engineering Co. states that its orders for transformers have been particularly good, a large number, totalling many thousands of kVA, having been despatched for use by Government Departments, municipalities and industrial concerns all over the world.



One of several Crompton Parkinson auto-synchronous motors supplied to the South African Railways and Harbours Administration

The past year has been a notable one for the Hackbridge Electric Construction Co. on account of the high level of export business, including transformers supplied to, or in course of manufacture for, Canada, South America, Australia, India, New Zealand, South Africa, China, etc., in sizes ranging from 30,000-kVA, 3-phase units, as installed in an Australian power station, down to large numbers of distribution units of the order of 200 kVA for China and to standard and high precision types of potential and current transformers for South Africa and other countries. Units of the order of 10,000 kVA for Canada and South America form an important part of the list of larger transformers for overseas, a number of these being for high voltages and fitted with on-load tap-changing equipment. Overseas engineers are recognising the value of the company's arc suppression (Petersen) coil as a means of greatly reducing breakdowns from earth faults, particularly on overhead lines.

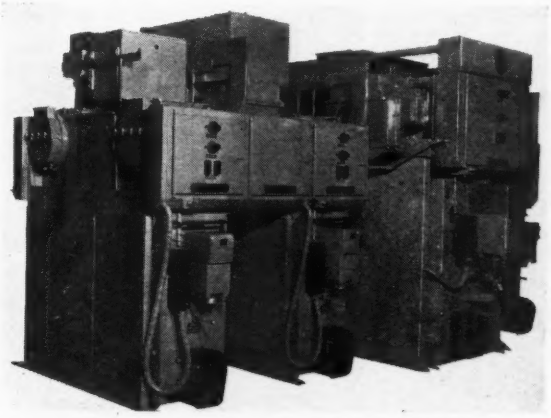
Three-phase transformers of the core type "OFW" rated at 12,500 kVA, 11/110 kV, have been made specially by Metrovick for use in India, where transport limitations necessitated the moving of the transformer and its tank in parts. Reassembly and drying out were effected on site by native labour. The transformers were given an impulse test at the works before despatch. Another type of transformer found useful in the export market is the 10,000-kVA three-phase core-type unit, 10/30-kV, delta/star connected, with plus and minus 12 per cent. tappings in 16 steps on the h.v. side actuated by a motor-driven on-load tap-changer. Additional h.v. tappings are connected to off-circuit tapping switches to give 10.5 kV on the l.v. side. The transformer is oil and water cooled and for use in Portugal these transformers have been supplied in a form adaptable at a later date to self cooling by detachable radiators. Buchholz protection is included. Some 10,000-kV single-phase core-type transformers, 110/22-kV are now in manufacture for New Zealand, where earthquake and severe lighting conditions prevail.



Lancashire Dynamo generating plant installed in a municipal power station in Western Australia

Manufacturing all sizes of transformers from a 50-kVA pole-mounting type to 30,000-kVA ON/OFB, 33-kV for power station bulk supply, the Yorkshire Electric Transformer Co. has carried out important contracts for leading undertakings in South Africa and New Zealand, and has recently completed and has at present in hand transformers to meet special requirements for the Near and Far East.

Two especially interesting large Hewittic rectifier groups have recently been manufactured for overseas. One is a 1,800-kW bank for the Buenos Aires Western Railway, one of a number of equipments making up a capacity of 15,000 kW. The other, which has been manufactured for a large smelting works in Canada, has a capacity of 8,300 kW and an output of 10,000 A at 830 V DC. The transformer supplying the rectifier is fitted with on-load tap-changing equipment to give a variation in DC voltage from 740 to 830.

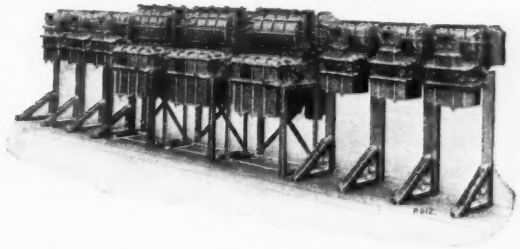


Portion of large Ferguson, Pailin switchboard for a Brazilian electricity supply undertaking

Another branch of industry which has rapidly developed is that of electric furnace work. The British Electric Transformer Co. has played a leading part in the manufacture of furnace transformers and a typical set for India comprises a 1,500-kVA, 3-phase, 25-cycle, 4,600/2,300/215-V delta, star/star connected transformer with reactor.

No introduction is required for the Metrovick "Paradyne" DC and "Thermac" transformer arc welding sets, or the company's range of resistance welding equipment comprising spot, seam, butt and flash butt welders, all of which are available for export. These machines are supplied in standard sizes, but being designed for flexibility in use can be modified for special applications without appreciable additional cost. A typical unit is the general purpose type "AS" spot welder available with various lengths of arm. Operation is completely automatic and pressures up to 1,000 lb. are obtained by the use of compressed air. Two "Thyratron" contact timers, one for the welding period, the other for the forging period, give accurate control of the welding characteristics. The use of two tapping switches allows a wide range of welding currents to be obtained.

Recent orders received by the International Electrolytic Plant Co. include three hydrogen producing plants—two for the hardening of edible oils, and one for the manufacture of oxygen and hydrogen for welding and metallurgical processes. The total make of gas from the three plants is approximately 650 cu. ft. of hydrogen per hour, with half that quantity of oxygen. Two of the plants are for India and the other for Ceylon. The company has also recently built very large plants for the manufacture of ammonia for fertilisers, one for Canada, consuming 6,500 kWh and producing 48,000 cu. ft. of hydrogen per hour, and one for Japan, using 23,000 kWh and producing 163,000 cu. ft. of hydrogen per hour.



Erskine Heap flameproof Buxton-tested switchboard for a large oil company in the Near East

Simplicity of installation, removal and maintenance, coupled with noiseless operation and low cost is a feature of Sumo electric submersible pumps which are now being utilised increasingly abroad not only for domestic supplies but also for power stations, waterworks, drainage schemes, factories, mills, mines, dairies, laundries, refineries, etc., as well as fire-fighting.

Repeat orders for trolley-bus equipments for several Canadian towns have been received in the course of the year by the General Electric Co., and the company's radio department has despatched a large variety of equipment to Johannesburg, including the radio receivers for the new broadcasting station which picks up and re-diffuses programmes from Great Britain and many stations in Europe and the British Empire.

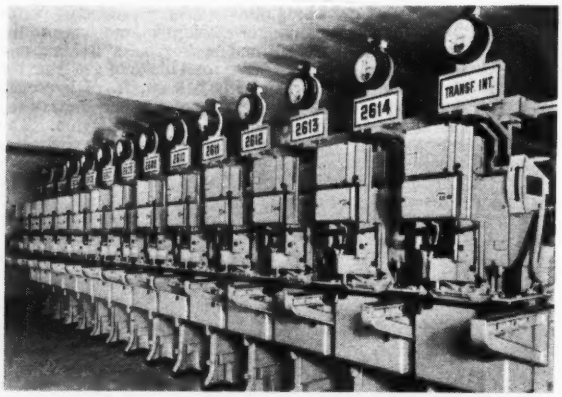
As an indication of the type of product which they find has the readiest sales abroad, Nalder Bros. and Thompson quote their type " L " triple-pole over-current inverse and type " NL " single-pole directional over-current inverse relays with definite adjustable minimum time characteristics; power factor meters with 360 deg. scales; and induction-type wattmeters with long circular scales.

A growing demand is reported for two of the standard Londex

A representative range of Bill switchgear sent overseas

instruments, namely, the heavy duty relay type " LF " used especially in connection with automatic seam and spot welders, railway signalling, etc.; and the high sensitivity relay type " HS " sensitive to voltage and current fluctuations and used for incorporation in voltage regulators and various types of automatic operating equipment in steelworks, battery charging plants, and wireless transmitting equipments. This apparatus is provided with special tropical finish for the United States, Canada, India, South Africa, New Zealand and China.

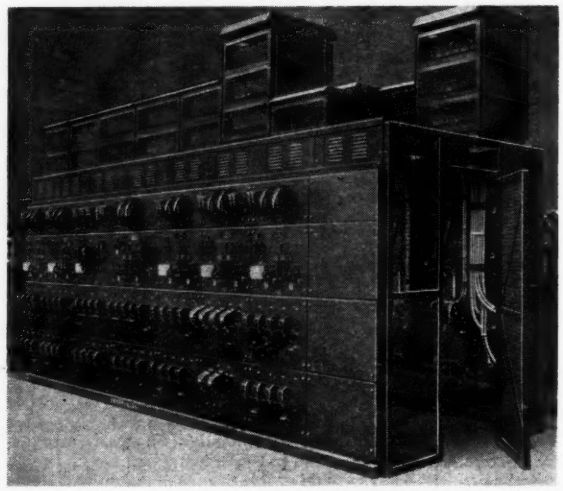
Within the past few weeks apparatus completed by Ferranti, Ltd., has included various types of testing gear forming part of an order for the Chinese Government. Some of this is to be seen in the illustration on page 595, which shows an 80-kV testing transformer with its control panel, electrostatic voltmeter and sphere gap, together with precision type instrument transformers, shunts and portable instruments. Among apparatus just despatched to New Zealand are three 6,667-kVA single-phase, oil-immersed water-cooled transformers forming a 3-phase, 20,000-kVA bank delta/star, 66/11 kV; also a moving coil regulator for use on a 3-phase, 50-cycle, 11-kV circuit. The last is designed for remote control for automatic operation and to maintain 11,050 V constant with



A fourteen-panel h.v. duplicate busbar Reyrolle switchboard supplied to a South American electricity undertaking

an input range of 11,050 to 10,200 V and a throughput of 3,000 kVA. Electrical instruments for all kinds of routine tests and fault-finding are productions of Marconi-Ekco Instruments much in demand.

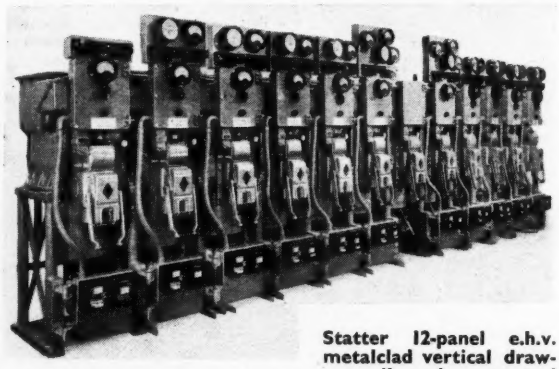
The demand for ceiling fans since the outbreak of war has been phenomenal. The complete re-design of the Crompton ceiling fan was completed shortly before the war and the makers have thus



Part of Igranic control gear supplied to the Karabuk Iron and Steel Works, Turkey

been able to execute wartime orders with the very attractive and highly efficient fan upon which they have now standardised.

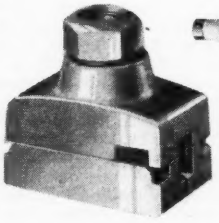
Mechanical draught equipment, comprising forced and induced



Statter 12-panel e.h.v. metalclad vertical draw-out oil and compound filled switchboard, one of many supplied to the Public Works Department, New Zealand

draught fans, together with dust and flue dust collectors, is being despatched by Davidson & Co. to Australia, South Africa, China, Chile, Thailand, Egypt, Trinidad, Mexico, Brazil and Portugal, and important overseas power stations at present being equipped with " Sirocco " products include those at Congella and Whyalla in Australia and the Klip and Vaal River stations in South Africa. The " Aeroto " patent screw fans remain in steady demand and orders are at present being executed for South Africa and Brazil, where they are required for mine ventilation and balanced draught, respectively. A large number of " Sirocco " axial flow compressed air-driven fans are being manufactured for the auxiliary ventilation of mines in South Africa.

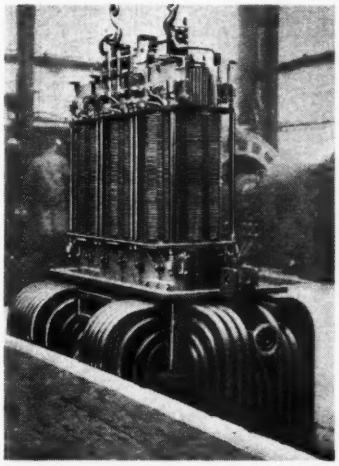
Instructions for the supply of heat treatment furnace fans have been received from Australia, where they are required for air supply and re-circulation of gases in a large aluminium factory, while Turkey, Trinidad, India, and Java are represented on the order list. An important order for " Sirocco " air washers has been received from South Africa for air conditioning in gold mines, and a plant for the drying of crepe rubber is at present being constructed for Indo-China. Orders have been received from India, Ceylon and New Zealand for dust removal equipment and cooling and drying plants. Pneumatic



Siemens "Zed" type fuse with "NUZ" fuse fitting

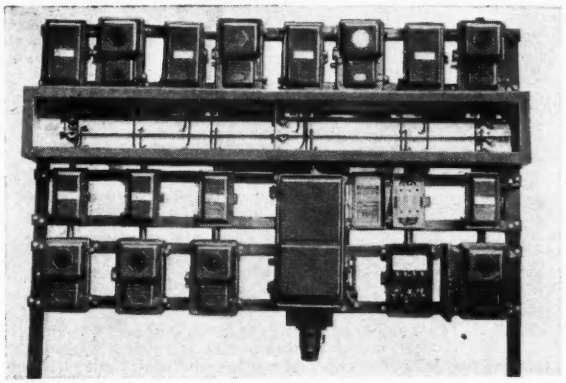
conveyance plant has been in steady demand for a variety of uses: an extensive contract of this nature has been received from South Africa for the removal of flue dust from waste-heat boilers.

Electro-medical instruments, including sun-ray equipment, have been formerly supplied to the Dominions and other overseas markets chiefly from Central Europe. A variety of features qualify the sun-ray lamp distributed by Perihel to replace this apparatus. In the Perihel "Mixray" sun-ray equipment an ultra-violet generator of the mercury-vapour type is conveniently combined with an infra-red element. These sets are simple and economical to operate and they have already been exported to Australia, New Zealand, South Africa and Canada, as well as to the Philippine Islands, South America and Iceland. Even in countries where natural sunshine is abundant the lamps are found useful for treating tropical and other diseases.



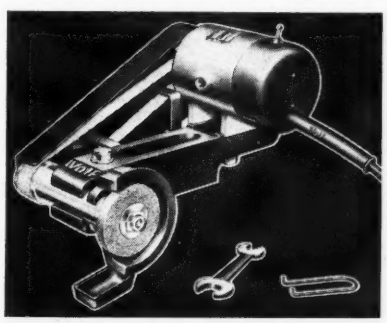
Typical Yorkshire Electric Transformer Co. 2,000-kVA 10,000/3,300-V transformer, showing core and windings being lowered into the tank

The lifts made by Etchells, Congdon and Muir, are exported to all parts of the world, recent contracts including a 2-ton goods lift for food storage plant in Iceland; passenger lifts for the Ministry of Posts and Telegraphs and the United Gas Co., Eire; lifts for gas undertakings in Sydney, Santiago and Denmark; many passenger and hospital lifts in New Zealand and a lift for the Seamen's Hospital at Malta.



Donovan switchboard for a sifting room in an Indian tea factory

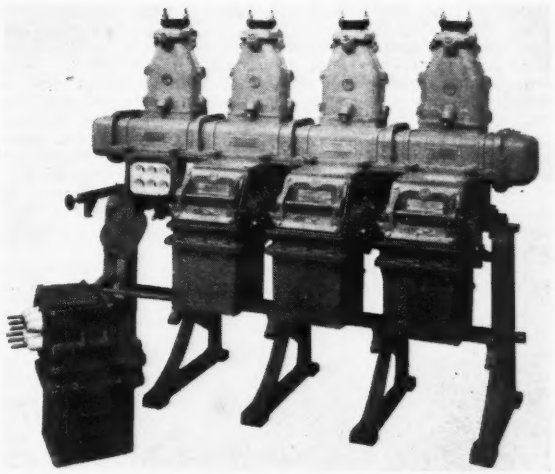
For the Argentine Government a considerable contract is in hand, comprising the complete electrification by the G.E.C. of four terminal grain elevators. Two electricity supply contracts recently completed by the same company



Wolf grinder, type "GL 30"

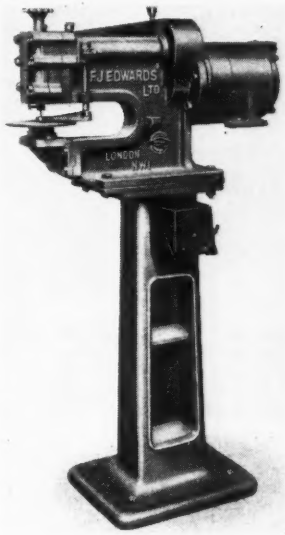
consist of a hydro-electric plant in Northern India and an outdoor substation scheme in Madras.

Among many large contracts for electric cable and distribution accessories which are being or have been completed for despatch to foreign countries by W. T. Henley's Telegraph Works Co. is one



M. & C. Switchgear circuit-breaker board for Australia

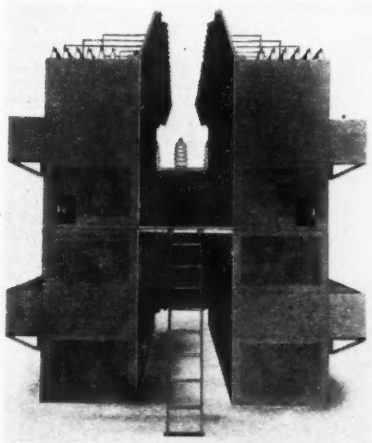
for an important Turkish municipality. This consists of the supply of over 27,500 metres of 35-kV and 20-kV paper-insulated, lead-covered, and steel tape-armoured cable, the bulk being 35-kV cable of the screened "S.L." type. The illustration on page 596 is of a consignment of Henley cable being loaded for delivery to one of the Dominions. This contract



F. J. Edwards type "NE" nibbling machine

included the supplying and laying of 27,000 yd. of 33-kV tape-insulated, lead-covered and armoured cable and 14,000 yd. of pilot, submarine and underground cables with 180 special joints.

The complete cable installation carried out by Ediswan Cables at the Karabuk Iron and Steel Works, Turkey, served as an excellent prelude to the export drive in cables. Completed just before the Government's appeal for export was made, it had taken two years and comprised over 70 miles of various types of cable. The Ediswan drive is directed towards the increased sale of paper-insulated and cambric-insulated cables rather than that of rubber-insulated varieties, since more rapid delivery of the former can be promised. Britannic Cables, too, are supplying considerable quantities of paper-insulated electric power cables of varying specifications to the Dominions, Colonies and South America.

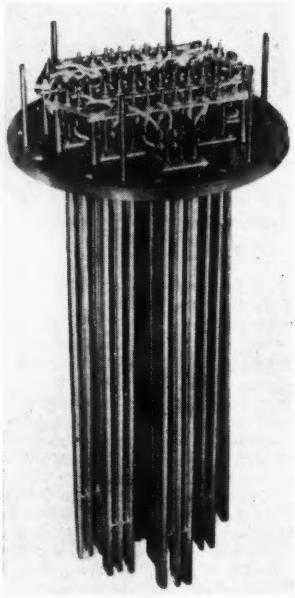


A 1,800-kW Hewittic rectifier bank for the Buenos Aires Western Railway, one of a number of equipments totalling 15,000 kW

Ward & Goldstone report that

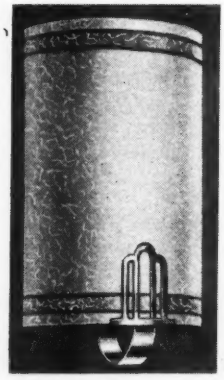
they have been able fully to maintain their extensive export trade which covers a wide range of products, including cables, wires and flexibles and electrical accessories. The company's bakelite insulated hooks, two-way moulded connectors, "Cliplite" lamp fittings and moulded wall and ceiling lighting fittings now in popular demand overseas, were lines largely purchased from Continental sources before the war. Though making no products especially for any particular market, J. A. Crabtree & Co. report good export business in their electrical installation accessories with which the home market is familiar. "Mycalex" (Parent) Co., makers of insulating materials, are also doing export trade with America, Sweden, South America, India, the Netherlands East Indies and Australia, and the company is about to manufacture mouldings.

While George Bray & Co. have in the past supplied strip and ring heaters for numerous purposes, large bank type immersion heaters for water and oil heating with loadings as high as 108 kW for one bank, and also large heaters with loadings of about 100 kW, the majority of the company's heaters are produced in small quantities for specific jobs. For instance, a special heater for coating ink rollers for the printing trade has recently been supplied to an establishment in Kuala Lumpur, Malaya.



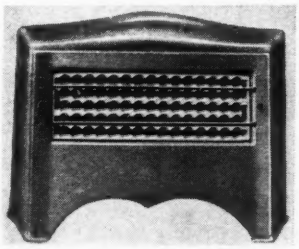
Jackson "192 JG" cooking cabinet with hob splashplate, legs and shelf. Right: Bray bank type immersion heater as supplied to Spain

The "Ediswan" Tungar battery charger, which is already well established in the export market, actually owes its design partly to its popularity overseas. Some time ago it was found that features incorporated to adapt it to overseas operation could be embodied in the standard type and thus produce a charger suitable for both home and overseas markets. Export trade in Tungars has always been good, particularly in India, Egypt and Palestine, but recently there has been some difficulty in meeting the demand due to the general expansion of export trade. One of the largest chargers ever made is now under construction for the Far East; it is designed for single-phase AC supply for battery charging, and its output is 60 A.



Wall-bracket fitted with "Berryphane" glass

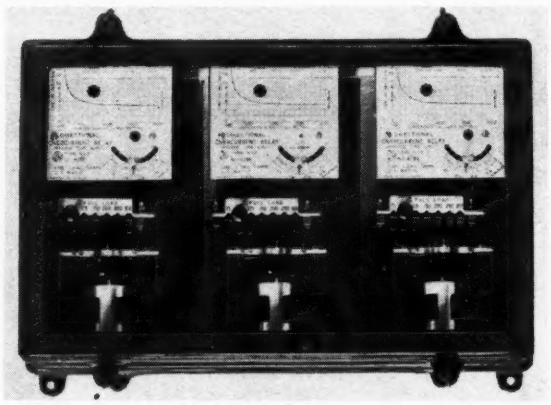
The increased activity in the overseas battery market can to some extent be traced to the world situation. In the Far East the accelerated activity of mechanised armies is placing heavy demands on the Edison Swan Co. for lighting and starter batteries, while other orders for car batteries have come from such widely separated places as Iceland, Malta and the Canary Islands. The increased use of military radio is making itself felt in the radio accumulator field, too, and large quantities of l.t. batteries have been shipped to Turkey. Furthermore, the export drive has given an added impetus to the demand for batteries for more peaceful purposes. Batteries have, for instance, been supplied for important Brazilian railway and signalling schemes for substation use. The difficulty of finding labour competent to undertake lead burning has now been overcome in the East, and the company, now sending only parts for replating jobs, has found an excellent secondary market in this direction, while another lucrative market is that of supplying special "Ediswan" totally-enclosed batteries for the Far and Near East tea estates.



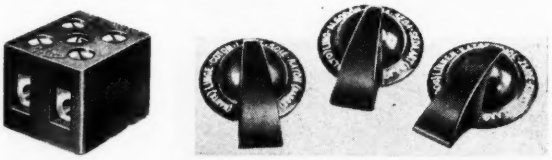
Belling "Empire" fire

Among illumination schemes that the G.E.C. has recently completed is an installation in Church Square, Pretoria (illustration on page 583). This comprises sixty 20-in. diam. spheres, each incorporating a 400-W mercury-vapour lamp, and twelve 5-ft. fluorescent tubes in white. G.E.C. fittings have also been installed in the new official residence of General Smuts, the South African Prime Minister. Several very important lighting orders have also been fulfilled since the war started by the Engineering & Lighting Equipment Co. In particular there was a sodium scheme for the half-mile long Storey Bridge, Brisbane, which was officially opened last July. This comprised 149 "Golden Ray" lighting units equipped with "Philora" lamps and makes use of an exclusive feature of this type of lantern to give the main distribution at 160 deg. Large shipments have also been made to South Africa, India, New Zealand, Singapore and Ceylon—and all these consignments have arrived safely. From their local branches Osler and Faraday are supplying a number of lighting fittings for furnishing palaces, a department in which they have specialised.

While business in the domestic market does not achieve quite the same prominence as the industrial and commercial apparatus sales, good steady business has been built up. Although in general overseas tastes in electric cookers differ from those in this country, many of the latest British models, especially the "streamlined" ones are finding considerable favour. Much in demand is the Jackson "Cleanline 192 JG" cabinet, a versatile unit which can be supplied in a variety of different styles—with or without hob cover, with short splashplate, with drawer or legs and shelf, and with the ultra rapid Backer-Jackson "Simmeradiant" four-heat or enclosed three-heat boiling plate. The older "92J" cooker has also succeeded in establishing its merits abroad.



Nalder Bros. & Thompson triple-pole type "NL" directional over-current relay

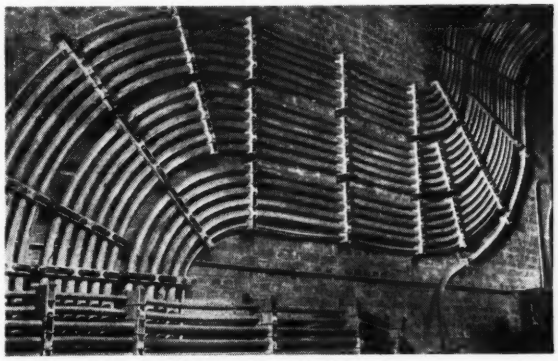


Ward and Goldstone moulded connector, and, right, Morphy-Richards iron control knobs worded in French, Spanish and Portuguese

The G.E.C.'s storage-type cooker appears to have found favour in New Zealand, where about 2,000 of this company's and other local companies' products are now in use. The "Baby Belling" and the breakfast models are the type of cooker for which Belling

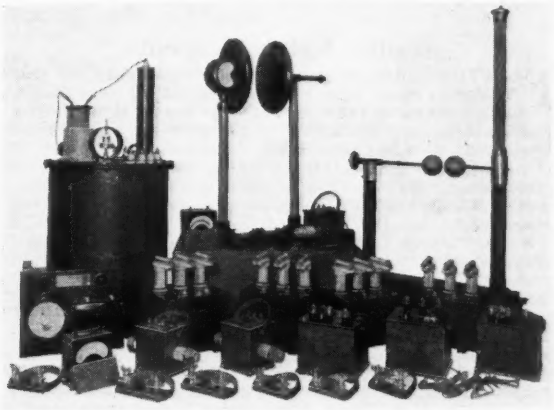
& Co. report a demand and the same company is also having considerable success with its "Empire" and "Dinkie" fires, constructed respectively of cast-iron and sheet metal, in straightforward clean designs and selling at very competitive prices. Berry's "Magicoal" imitation coal fires are most popular overseas and in particular the No. 504 log fire is in demand where the price of electricity is very high and where central heating is universally used. In such cases these fires are being ordered on account of their firelight appeal. The "Berrygem" fire, both "Flecta" and standard patterns, have recently been ordered in considerable quantities for export. Their manufacturers are hoping, too, that their lighting fittings incorporating "Berryphane" glass will have a ready sale abroad, particularly in the countries where "Meissen" glass, from which it is almost indistinguishable, has in past years been the vogue.

So far as the overseas market is concerned Morphy-Richards



Ediswan cables at Karabuk Iron and Steel Works, Turkey.

are concentrating on their well-known range of electric irons. These are in every way similar to the models sold in this country, except that the wording on the control knobs is now printed in the language of the country to which the irons are sent. Special publicity matter in connection with these irons has recently been completed in Dutch, Spanish, French and Portugese. Lighting fittings, irons, hair-dryers, saucepans, coffee percolators and illuminated mirrors are a few of the lines which S.L.R.



Ferranti testing apparatus for the Chinese Government

Electric is at present manufacturing chiefly for the export market. In addition the company is still able to supply from its London stock many of its standard lighting and other units.

All the standard Wolf portable electric tools are being supplied regularly to overseas customers and machines especially in demand are the light production ¼-in. capacity hand electric drill, type "EG. 2c"; the precision lay grinder type "GL. 30"; and the portable flexible shaft filing and grinding machine. The "Besco" type "N.E." nibbling machine (F. J. Edwards) with flanged electric motor drive is being extensively used for cutting shapes in sheet metal and steel plates where the quantity of articles required does not justify the cost of blanking tools.

Communal Feeding Centres

THE proposals of the Ministry of Food for the organisation of communal feeding on extensive lines have created problems regarding suitable equipment for cooking and heating, and the British Electrical Development Association has issued a booklet entitled "Electricity and Communal Feeding" which illustrates the various ways in which electricity is helping to solve these problems.

In addition to lighting, refrigeration, and food-preparing machines, electricity has been chosen for the main cooking requirements in many kitchens established for Civil Defence workers, and has proved to be a reliable means of catering for from 50 to 500 persons or more. Experience under air raid conditions has shown that even where cables in streets have been subject to bomb damage, in many cases they have not broken down, and in other cases the electricity supply has been restored in a few hours.

In some towns which have been subject to heavy raids, local authorities have provided mobile electric kitchens to meet urgent demands, as these can be taken to the affected area and a supply of electricity obtained by special temporary cables from the nearest available point; in large shelters, however, such as the tube stations of the London underground railways, equipment for light cooking has been installed.

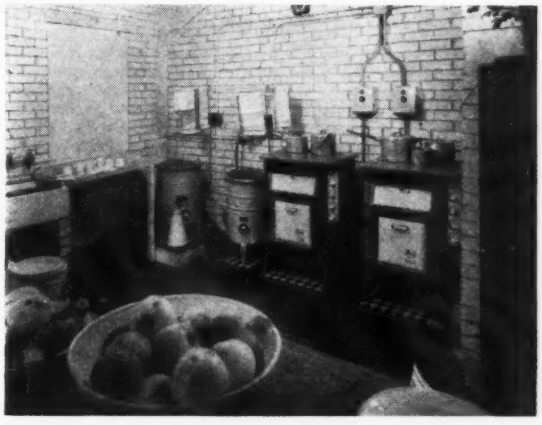
The Ministry of Food has urged the establishment of communal feeding centres in every town, not only to effect economies in the consumption of food and fuel, but also to meet the needs of people, who, owing to their new mode of life and occupation, no longer have the time or facilities for obtaining a good meal in the middle of the day. Such centres have also become necessary for children in reception areas and evacuee mothers. An example of what is being done in this direction is provided by the Bargoed Educational Settlement which has established a feeding centre in a local hall. Two electric cookers have been installed and meals are prepared by evacuee mothers at a cost of 4d. for adults and 3d. for children.

Electric cooking equipment for large-scale catering is normally specially designed, but such equipment may at the present time be difficult to obtain quickly. Experience has shown that large domestic cookers will give satisfactory service and in many cases can be obtained on simple hire and maintained by the local electricity supply authority. The cooker of the "8-10 person" type is the most useful size.

Electric wash boilers have proved of great value in the feeding centre kitchens as they can be used for making tea, vegetable boiling, soup making and boiling puddings. For catering for 50 to 100 persons E.D.A. suggests that two large domestic cookers and one or two wash boilers (8-10 gallons each) are enough, provided that sufficient large-size utensils are available, and it is considered that three cookers and three boilers would suffice for between 150 and 200 persons.

The booklet points out that while cookers and water heaters form the principal electrical equipment of food centres the electrical service can be extended by the inclusion of such appliances as toasters, bread slicers, meat slicers, potato peelers and washing-up machines, and a list is given of all kitchen equipment which may be required for catering for 100 persons.

There are some useful hints on the best use of electric cookers and boilers, while such matters as kitchen planning and management, purchasing of food and the cost of running a feeding centre are also dealt with. Some informative notes on the nutritive value of food are included.



A typical electric kitchen: in addition to the cookers and boilers, the shelter is electrically heated and ventilated

INSTITUTION PROCEEDINGS

Characteristics of Lightning. Gauging Weak Light.

Radio Valve Currents

FLUCTUATIONS of currents which are limited by space charge in diode radio valves are considered in a Wireless Section paper by Dr. F. C. Williams released by the INSTITUTION OF ELECTRICAL ENGINEERS. The author has experimentally investigated in the Electrotechnics Department of Manchester University, with special Marconi diodes, the dependence of the space-charge smoothing factor on valve geometry. The problem is of great complexity and serious physical discussion has not been attempted.

It is well known that spontaneous fluctuation in the case under discussion is much less than that associated with a current that is limited by temperature. Attempts to predict the extent of the reduction have produced numerous hypotheses, none of which has yielded values agreeing with experimental results. Their discrepancies and relationships are discussed in some detail in the hope of indicating a new line of approach. The reduction is conveniently expressed as the ratio of mean square values of equal currents influenced in the two ways mentioned. When expressed as a function of the ratio between barrier-to-anode potential and the mean emission energy (expressed in volts) it becomes independent of valve geometry.

Further experiments are suggested by a spurious effect, of unknown origin, which may have been due to the charge collecting on the glass envelope ; if this could be prevented it is possible that valves would have a better signal-to-noise ratio. It also seems that " cool end " effect, or any other source of temperature-limited components of anode current, is unimportant in the case of oxide-coated cathodes operated at their rated temperature.

The Lightning Discharge

A LIGHTNING flash represents an average charge of the order of 30 coulombs, some 50 per cent. greater than has hitherto been commonly supposed, about one-third of it probably being neutralised by the intervening space charge. Such is one of the conclusions reached in a paper by Messrs. C. E. R. Bruce and R. H. Golde, released by the INSTITUTION OF ELECTRICAL ENGINEERS, being an official communication (S/T 18) from the British Electrical and Allied Industries Research Association.

An E.R.A. survey of available data, including Radio Research Board records, has indicated that lightning flashes in all thunderstorms are similar in respect of times involved and number of strokes in a flash. The present authors attribute Norinder's values of the time characteristics of flashes, which differ markedly from all other data, to misinterpretation of his records. It is suggested that the cloud potential required to cause a discharge is only a few per cent. of that hitherto believed to be necessary, being of the order of 5×10^7V so that the energy involved in a flash is more like 250 kW rather than Wilson's value of 2,800 kW.

Consignment of Henley cable being loaded for delivery to one of the Dominions

A theory is advanced, bearing on the natures of leader and return strokes, which enables the shape of the current wave to be calculated and, in addition, a form to be derived for the whole current wave in a multiple flash. There is evidence that the later strokes of a flash are less intense than the earlier strokes, while successive strokes are initiated by streamers *from* the original stroke *to* other cloud centres. Experimental confirmation is needed for the authors' suggestion that strokes to phase wires of transmission lines which do not cause flashover are unlikely to be followed by subsequent strokes. The polarity of strokes passing to circuit phase wires cannot be deduced from that of strokes to line towers because it has been established that the polarity of flashes to earth differs in tropical and temperate regions.

Fresh light has been thrown on the analysis of the electrostatic field change caused by a stroke, later calculations agreeing with observations of the magnetic and radiation fields as regards shape and amplitude, Norinder's values for the currents in individual strokes are said to be erroneous because hitherto their comparison with magnetic-link data has overlooked an important selective principle, which renders their agreement disconcerting.

The peculiarity of flashes to the Empire State Building in New York is that the currents involved are greater than those of flashes to normal country. Two considerations render meaningless the distribution of currents as presented by McEachron, for the charge recorded by him for a stroke with upward leader includes the charge needed to neutralise the space charge during the first leader stroke, in addition to that required for the neutralisation of the cloud charge. The magnitudes of the cloud and space charges arrived at afford an explanation of the observed data on electrostatic field charges.

The present authors believe that existing ideas about the ratios of the three components of the electrostatic field charge due to a stroke are erroneous and suggest that Schonland's records of the slow field-change are considerably affected by leakage of the charge induced in his aerial. Negative flashes to earth are more frequent than positive flashes, the ratio being considerably smaller in temperate than in tropical regions. A larger proportion of very high positive currents is observable than negative. The authors support the suggestion that the wave form of atmospherics is due to successive reflections from the ionosphere rather than to current pulsations in the lightning channel.

Low Illumination Values

TWO short papers were presented at the April 8th meeting of the ILLUMINATING ENGINEERING SOCIETY in London. In the first Dr. J. W. T. Walsh (National Physical Laboratory) explained why the gauging of low values of illumination and brightness was difficult, both on account of the reduced sensitivity of the eye to brightness differences and because of the operation of the Purkinje effect. The need was generally for measurements that would represent what was experienced under practical conditions, and so coloured light was measured by visual comparison with white, the results being termed " apparent " values. Features of design of gauges and illuminometers constructed with reference to BS/ARP. 30–52–18 were described.

In the other paper Mr. J. S. Dow (secretary of the Society) dealt with visibility by white and coloured light. The main factors were, first, the Purkinje effect relating to the peculiar behaviour of the eye towards colours in weak light, the eye becoming much more sensitive to one end of the spectrum than to the other. Hence the apparent brightness of green or blue sources of light might be very much greater than that of similar sources of red light, although the calculated illumination might be the same in both cases.

With very low illumination the sense of colour was lost ; the sensation faded out completely at one end of the spectrum (so that red-coloured objects appeared to be black) though it persisted at the other end (so that blue appeared to be faint grey). This change in sensitiveness was complicated by the fact that the centre of the eye (while still retaining sensation) was more sensitive to red than to blue whereas the reverse obtained in respect of the peripheral region of the retina. Hence if two patches of red and blue light appeared to be equally bright at close quarters, on walking backward the red would become the brighter of the two because both would then be " seen " by the central region of the retina. As the illumination diminished a position would ultimately be reached at which vision was effected by the peripheral region of the eye, which retained its greater sensitivity for blue light.

Secondly, there was selective absorption by the atmosphere, about which many conflicting opinions had been expressed. Thirdly, there was the influence of colour on the acuteness of vision, which was equally controversial. Finally, the influence (if any) of colour on visual ability in other respects, such of speed of perception, had to be taken into account.

In so far as general outdoor lighting was concerned the utilisation of colour was on the whole inexpedient, because hues in themselves tended to attract attention and could only be obtained on a large scale subtractively, which was essentially uneconomical (filters reduced the light to less than one per cent. of its original value). Accordingly wartime street lighting had been based upon the most economical employment of white light. A similar conclusion had been reached in Germany.

Maintaining Supply

Minimising the Effects of Air Attack

By S. C. Harling, Assoc.I.E.E.

EXPERIENCE already obtained in operating an undertaking under war conditions makes it possible to review the fundamental arrangements that have been found essential to the successful continuation of service under, and after, air bombardment. The principal requirements come under five main headings :—Organisation of staff, co-operation of essential services, mutual aid, conservation of stores and transport, and continuity of supply.

Of first importance is the efficient organisation of the whole of the staff of the undertaking for this purpose, as on this depends the success of the measures adopted. The organisation can be divided into two essential parts, viz., safety of personnel and departmental intercommunication. Effective instructions, and suggestions, on methods of providing shelter from the effects of bombs have been issued by the appropriate Government Departments, but while these are of great value they do not, in themselves, afford sufficient security under the conditions of aerial attack.

Members of the staff who are required to be available for duty during an air raid should be dispersed. The duties of the key men in particular must be so arranged that the possibility of any departmental or sub-departmental head and his deputy both becoming casualties is remote. Members of the technical and manual staffs should be organised into squads preferably consisting of eight men each, as follows :—Leader (technical assistant), deputy leader (technical assistant), contact man (technical assistant or responsible official), jointer, jointer's mate, linesman, linesman's mate and driver. A 2-ton lorry and a light van are needed.

The author, who is distribution superintendent of an undertaking serving an area of 300 sq. miles, describes an organisation that has proved its value in service

An undertaking with a large area of supply will require several such squads. As many of the men as possible should be able to drive a car and the leader and deputy leader should have the telephone installed at their homes. In order to avoid tiring the staff unnecessarily, only half the squad should turn out on an "alert," the remainder waiting until they are called upon or until they hear bombs exploding.

Control of the whole of the distribution system must be vested in one individual, situated at a suitable protected control centre with a small staff of assistants. The minimum staff required for effective working is a control engineer, a telephonist, a plotting clerk and three messengers. The whole of the control-room staff should be triplicated, and one or more of the squad leaders may have to deputise for the control engineer. The control room should be fitted with separate telephones for incoming and outgoing messages, and have adequate standby lighting arrangements and fire-fighting equipment. Continuous manning of the telephone is essential.

Accommodation for Staff

The foregoing requirements, together with the necessity for each department to be free to attend to its own problems during the raid and the importance of close collaboration during the work of restoration, call for the provision beforehand of suitable alternative accommodation for the staffs and meeting places for heads of departments.

A list of alternative places of accommodation should be prepared and steps taken to ensure that the whole of the staff know exactly what to do, and where to go, in the event of their normal place of employment being damaged. The arrangements should allow for at least two, and preferably more, alternative places of accommodation and should cover every section of the staff. For the heads of departments a definite time should be arranged for meeting at, say, 10 a.m., on the morning after a night attack, so that full collaboration between departments can be obtained and reports to the Regional Commissioners, the Electricity Commissioners, and Government Departments, can be drawn up. The possibility of using some of the larger substations for accommodating the staff should not be overlooked, bearing in mind that any normally exposed live metal work must be screened beforehand. A responsible official must always be present during the period of occupation to comply with the Electricity Supply Regulations.

For coping effectively with any large repair work that may be necessary mutual-aid schemes are being inaugurated throughout the country, and many of these are already working. Full details of the personnel, transport and stocks of material available in each of the associated undertakings should be catalogued, and the telephone numbers and addresses of the senior staff members listed. Details of the method of drawing upon the personnel, transport and material should be agreed upon, with method of charging for time and material, together with insurance arrangements. In order to augment the help available agreement with other associated groups is desirable.

The existence of help through mutual-aid schemes does not, however, in any way relieve individual undertakings from taking all possible steps for the conservation of their own materials and transport. Both stores and transport should be dispersed ; the serious results of omitting to take this precaution have already been made evident in areas involved in air attack. A list of emergency stores should be prepared covering the requirements of all ordinary repair work.

The provision of transport facilities in emergency must be organised. For storage purposes, substations may be used. A complete selection of essential material for any particular type of repair must be available from any one storage depot, to avoid unnecessary transport delay in collecting material from more than one place for any particular job. Where an undertaking has an organised central transport depot, the dispersion of the vehicles has certain disadvantages. Nevertheless a reasonable proportion should be separately garaged at night, preferably in close proximity to the drivers' homes.

Each squad leader should be equipped with an operational map of the distribution system. These maps, in indexed sectional form, should be printed on linen to a scale of 1/2,500 and bound in stiff covers. They should show all high- and lower-voltage feeders and distributors and the positions and connections of the associated substations, switch stations and disconnecting boxes. Maps should be numbered, and at each of the four sides reference numbers should be given of the adjacent maps. The substations and switch stations also require numbering so that quick reference can be made to the record cards at the office of the undertaking. Alterations in connections and mains and substations out of commission, should be reported to the control engineer and the maps returned to him for correction.

Even in peacetime such maps are of great value in routine work and breakdown service, aiding considerably the speedy restoration of supply. In the present emergency they are indispensable, when extensive damage may so alter the normal working of the distribution system that the squad leaders doubt the accuracy of their own memories. Duplication of all essential records is an obvious necessity. The copies should be kept where they are reasonably secure and accessible for making alterations and additions.

All the foregoing arrangements have one main object in view, *i.e.*, continuity of supply. It follows that every effort should be made to ensure that the design and operation of the distribution system is such that the maximum safeguard is obtained against unnecessary interruptions in sections adjacent to the site of any damage. The importance of the practical help, and the psychological effect, of the maintenance of the electricity supply during a raid can hardly be over-estimated.

Section Interconnection

The Electricity Commissioners have recently issued a memorandum of suggestions based on collective experience. Amongst these is one that the various sections of the distribution system should not be interconnected. With this unqualified statement I disagree. My own experience is that, while the various sections of the distribution system should not be solidly interconnected, interconnection of the lower-voltage distribution system, carried out thoroughly by means of correctly-graded h.r.c. fuses or circuit-breakers fitted with definite-minimum inverse-time relays, is an invaluable help in the maintenance of supply.

It is, of course, essential that the interconnecting points shall be carefully chosen and that the fuses or circuit-breaker relays shall be correctly graded. For this purpose the maximum short-circuit currents at all the points of interconnection should be calculated. The adoption of this method of safeguarding supplies is far more effective and less costly than the attempt to safeguard all substations against the results of blast, and it gives protection against unnecessary interruption of supply due to cable damage.

A further point of some importance, having regard to the present restriction of materials, is that interconnection of the low-voltage mains system in the manner recommended effects a saving of from 20 to 30 per cent. in the installed transformer capacity required with a consequent saving in distribution loss.

Fluid Cable Insulation

The Use of Oil alone as a Dielectric

By Lt.-Comdr. Richard B. Fairthorne, R.N., A.M.I.E.E.

FOR many years high-voltage cables have been dependent upon one class only of dielectric substances, *i.e.*, suitable paper impregnated with a fluid insulating medium. To-day limits of working voltage appear to have been reached temporarily for three-core paper-insulated cables and there has been an increasing dependence upon single-core cables for 100 kV and upwards. There are cables in which fluid dielectrics reinforce the impregnated paper, such fluid dielectrics being held in canals or cavities prepared in the solid dielectric or in the centre of the conductor. In other cases, the use of compressed air has been considered.

The use of an insulating oil *alone* in contact with bare metal conductors must, I believe, have occurred to many engineers since the inception of oil-break switchgear and oil-cooled transformers, but presumably on estimating the costs for voltages of 11 or even 20 kV the pioneers have been unduly timid in examining its further possibilities. Even if these had been considered, there were a number of imperfectly comprehended physical phenomena which were not taken into account.

The essential features of the system advocated are: The use of spaced porcelains within steel conduit containing a suitable fluid such as mineral oil; continuous circulation of the fluid through the porcelains; means for providing for the expansion of both copper conductor and fluid dielectrics, and for the anchoring of the former; means for closing relays controlling the tripping circuits of the switch in the event of a leakage of oil; good thermal conductivity of the fluid as compared with that of impregnated paper; use of tinned conductors; and provision for the collection of occluded air at high points in the system.

In the first place, the circulation of the oil increases the dielectric strength. If the installation is designed for oil in a stationary condition the electrical factor of safety will be increased as the rate of flow increases.

The loss of energy due to the variation in the ohmic resistance of the cable with change of working temperature would be kept within much lower limits than in the case of paper-insulated cables owing to the superior thermal conductivity of the oil. Alternatively, so long as there is no sacrifice of rigidity of the conductors, the current density of the conductors may be greater than is safe with existing systems, and a smaller section of conductor may be employed. All occluded air can be collected at definite points in the system. Moreover with circulation the condition of the fluid dielectric can be determined at any time. Whenever necessary it can be cleaned in a centrifugal purifier.

None of these features accompanies the use of impregnated paper plus fluid insulation. There can be no free flow of oil, no removal of occluded air. Moreover the makers of the present semi-orthodox cables appear to have disregarded the Michie phenomenon of the sludging of oil at certain temperatures when oil containing air is in contact with bare copper. This takes place very slowly, but when it has once occurred it leads to overheating and ultimate breakdown in transformers. Also insulating oils containing small fibres are low in dielectric strength. Where cotton is used, as in many transformers, the natural circulation of the oil prevents these fibres from being held in any electrostatic field and becoming the proximate cause of failure. As there is no free circulation of oil throughout the class of cables referred to, fibres are likely to collect, and also will tend to collect at high points in spite of all means so far used to maintain the fluid under more or less constant pressure.

It is evident that oil in circulation will meet all electrical conditions, and that it is more logical to use either oil by itself or impregnated paper by itself than to attempt to combine them. Furthermore, in constructional cost, an all-fluid dielectric appears attractive by comparison with other types of super-voltage cable.

CORRESPONDENCE

Every letter must be accompanied by the writer's name and address preferably, but not necessarily, for publication. The Editors cannot accept responsibility for correspondents' opinions.

Fluorescent *versus* Gasfilled Lamps

I was glad to see that Mr. W. J. Jones, in his letter on this subject, in your issue of April 4th, stressed the fact that "light is only bought to achieve one end, namely to enable people to see," for although this may seem obvious, it is often lost sight of in elaborate technical discussions, and I have always tried to keep it in mind and to encourage others to do so.

From Mr. W. Walton's letter and Mr. Jones's comments thereon it would appear that the relative cost of using fluorescent or gasfilled lamps depends mainly on local charges for electricity, low charges favouring gasfilled and high charges favouring fluorescent lamps. Surely this is a very unreal criterion, having little or nothing to do with the real technical merits of the respective types of lamp. Financial costs are not a true reflection of real costs (in material and labour) as they should be, for the real cost of generating and distributing electricity has continually decreased with increasing technical knowledge and experience, whereas the financial cost in many cases has been artificially and needlessly inflated by fictitious debt, created by the present outrageously inefficient financial system.

We were promised that the grid scheme would lead to a great reduction in the costs of electricity, but needless to say this has not materialised. Promises of this kind never do and never will come off, under the existing financial system. Fortunately the system cannot last much longer and when the necessary fundamental changes have been made we shall be in a better position to judge of the relative merits of fluorescent and gasfilled lamps, without being led astray by essentially meaningless financial figures.

Hence I agree with Mr. Jones that "apart from the comparison of cost of producing light it is equally important .... to consider the quality of light," in fact I would go further and say that the latter is much more important. I think, however, that the quality required, in the interests both of efficient work and the preservation of eyesight, is the closest possible approach to daylight, and I believe that can be achieved more effectively and more economically, even under present financial conditions, by means of gasfilled lamps in conjunction with correct filters and correct reflecting and diffusing arrangements, than by fluorescent lamps.

G. V. DOWNER.

"Recent Testimonials"

It would be extremely interesting and helpful to many readers, I feel sure, if advertisers in your "Situations Vacant" columns would give their interpretation of "recent testimonials." There is, I notice, always one notable exception to this form and that is in the case of Brighton's requirements wherein Mr. Clinch always specifies "names and addresses to whom reference may be made."

In common with many others I find the provision of testimonials most difficult, and I am sure it constitutes a definite drawback to one's chances, by prospective employers ignoring applications without these "qualifications" appended. I admit that references entail more work from the employer's point of view, whereas with the other method everything is to hand. Perhaps they do not realise how difficult it is to obtain a testimonial from the firm with whom one is still employed. In many instances firms refuse to supply them and apparently have good reason for this. On the other hand many would-be applicants refrain from asking for them, as it is not always advisable to acquaint one's employer of one's desire to leave until it becomes an actual fact.

A "rolling stone" may be able to meet these requirements, but to the average individual "three recent testimonials" must require some hunting up. I admit that I am a novice in the application game, and I look for some help and advice from old triers who know the ropes. "Situations Vacant" advertisements are often of a stereotyped nature and application forms might well be the same. This would at least have the advantage of putting all persons on a standard basis at the start—by making a bare declaration of facts—as the man submitting the glowing tribute to himself is not always best suited for the job.

POWER ENGINEER.

Leases and War Damage

Procedure between Landlord and Tenant

By F. E. Sugden,
A.C.I.S., Barrister-at-Law

MANY people engaged in the electrical industry are beset by numerous war problems, particularly those who have suffered from air-raid damage. Formerly this was confined to the London area but unfortunately it has become widespread in the Provinces and what I am about to consider is a subject which is applicable throughout the country. Many electrical concerns have their premises on lease and consequently they have what is deemed in law a full repairing lease which means that at the end of the lease they will have served upon them a schedule of dilapidations and, at least in normal times, would be compelled to execute running repairs to the premises, particularly where there is some machinery on the premises which has weakened the floor through constant vibration.

In peacetime these problems, though somewhat difficult, could within certain reasonable limits be surmounted, but in wartime new considerations arise. Unfortunately many have suffered as a consequence of enemy action either from a direct hit or from blast from a bomb or a land mine. The result has been that their premises have been damaged beyond repair and those who have rented premises would nominally have to pay rent, even though such premises do not exist, unless they adopt the procedure which has been laid down.

This article explains the position of a tenant of rented premises which have been rendered unusable by enemy action and sets out the procedure which he must follow to avoid liability for further rent

Let me first impress upon the reader once and for all that the very fact that his premises have been rendered uninhabitable or unfit for occupation does not, of itself, exonerate him from liability for payment of rent. Therefore in order to escape liability he must adhere strictly to a specific legal procedure. Thus, it behoves the tenant of such premises to be thoroughly familiar with the disclaiming of leases. This is also important because, apart from his own premises, he may have a maintenance contract with a large firm the premises of which have been bombed, and he should be in a position to advise the firm as to the procedure he must adopt in order that he may execute the work, having due regard to the Government grant, because of damage to the premises by enemy action. Another reason why he should be thoroughly familiar with the disclaiming of leases is that he may be called in when property has to be repaired, involving the electrical installation.

Schedules of Dilapidations

If the electrical engineer himself is nearly at the end of his lease and his premises are bombed he will no doubt have received by now a schedule of dilapidations which he is compelled to carry out at his own expense so that the premises may be handed over to the landlord. Let me say at the outset that, broadly speaking, the electrical engineer, or any tenant for that matter, is not liable for dilapidations if his premises are damaged by enemy action, but he must disclaim or set certain legal machinery in motion before he is exonerated from liability. On the other hand he can only disclaim the lease if the bombed premises are unfit for habitation or business purposes.

It is important therefore that the electrical engineer should know how this disclaiming of leases can be effected so that he himself can carry out the work or advise his client, who may be either the tenant or the landlord. A landlord might wish to dispute the act of disclaimer and thus call in the electrical engineer to effect the electrical repairs, or he himself might wish to disclaim the lease because he has been the sufferer, also as a consequence of enemy action.

The procedure to be adopted to disclaim the lease of premises is primarily governed by the Landlord and Tenant (War Damage) Act, 1939, passed at the outbreak of war to modify the rights and liabilities of landlords, tenants, and other persons interested in property damaged by the war. Naturally, for the benefit of the electrical engineer, I am confining myself strictly to the tenant's position so that he may get a true perspective of the state of affairs brought about by war conditions.

Where there is an obligation on the tenant to execute repairs in relation to the property he holds on lease, those provisions should be considered as not extending to the imposition of any liability on that person to make good any war damage occurring to the property. This applies where it is impracticable, or at least only practicable at a cost which is unreasonable in view of all the circumstances, or there will be no specific advantage to the person who, but for the provisions of this sub-section, would be entitled to the benefit thereof.

Where air raid damage has occurred the tenant should serve on the landlord a notice giving particulars of the damage. Where the property comprised in the lease is unfit for habitation by reason of war damage the following provisions must be carried out:—The tenant must serve on the landlord, if he wishes to disclaim the lease, a notice of disclaimer, or if he wishes to retain the lease a notice of retention. If no such notices are served on the landlord, the landlord may serve on the tenant a notice to elect requiring him to serve either a notice of disclaimer or a notice of retention. Where a notice of disclaimer has been served by the tenant the landlord may serve on the tenant, within one month, a notice to avoid disclaimer. The tenant can, in turn, serve on the landlord within one month what is termed a "counter notice" saying that the property is unfit for habitation. This matter then goes before the appropriate Court.

Where the tenant serves a notice of disclaimer on the landlord he should provide the following particulars: (*a*) A term of all the rent reserved by the immediate under-lease of the property comprised in the lease, or any part thereof; (*b*) The name and address of the person to whom that under-lease was granted and of the person to whom it has been assigned, if any; (*c*) If the term created by the lease is mortgaged, particulars of the mortgage including the name and address of the mortgagee and his successor in title, if any. (1) As from the date when the notice of disclaimer was deemed to have been surrendered and (2) all sub-leases derived out or the term created by the lease disclaimed shall also be deemed to have been surrendered.

When the application is made under this Act the Court, which is frequently the County Court, will have power to modify the operation of a notice of disclaimer by varying the date on which the lease is deemed to have come to an end or by varying limitation of liabilities under the lease. But where a notice of retention has been served it shall still operate subject to the following provisions:—That the premises shall be made fit after an air raid as soon as is practicable by the landlord and when that is done the Court shall direct when it will be necessary for the tenant to pay rent again to the landlord, or, if the landlord fails within a reasonable time, the Court will fix a time when the tenant may carry out the work and charge the amount to the landlord upon his failure to carry out the Court orders.

A Case in Point

Whilst I am on this subject I would like to quote the recent case of Clavering *v.* Conduit Mead Co., because this is a new procedure brought about by the Landlord and Tenant (War Damage) Act, 1939, and cases are only beginning to peter through the Courts. Briefly the facts were these:—An application was made by the tenant that his application to disclaim his present lease, should be transferred to the High Court. The case was against the landlord for disclaimer of the lease pursuant to the Landlord and Tenant (War Damage) Act, Section 23, and the County Courts Act, 1934, Section 111, and the tenant desired it to be transferred to the Chancery Division of the High Court.

The ground of the application by the tenant was that there was an agreement with the landlord and in accordance with the Landlord and Tenant (War Damage) Act, as the premises had been damaged by enemy action the tenant desired to disclaim the ground-lease. It was therefore necessary for the tenant, in order to disclaim and cancel the operation of the lease, to obtain

an Order of the Court. Section 23 of the Landlord and Tenant (War Damage) Act lays down that the case was subject to the provisions of Section 111 of the County Courts Act, 1934 (which provides for the removal into the High Court of any proceedings begun in the County Court).

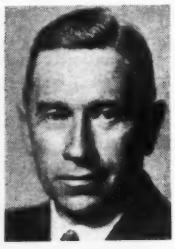
The Judge, giving his decision, said, it was necessary that he should think it desirable that the proceedings in question should be heard and determined in the High Court before he made the Order. Apart from the fact that the amount valued in the case might be a very large amount, the rent reserved under the lease being a very substantial rent, it would appear likely that expert evidence would be required on several matters. More than that, the Landlord and Tenant (War Damage) Act, 1939, is a recent Act and there is so far an absence of judicial decision on certain important questions of law which may arise. In these circumstances the Judge thought it right that the case should be transferred to the High Court. Many more cases will be heard shortly and the number will gradually increase.

PERSONAL and SOCIAL

News of Men and Women of the Industry

IN our issue of April 11th we announced that **Lt.-Col. W. A. Vignoles, D.S.O.**, while remaining a member of the board of Evershed & Vignoles, Ltd., had been obliged to relinquish his appointment as senior managing director owing to ill-health. Colonel Vignoles was born in 1874 and received his technical education at Finsbury Technical College, following this with a period in the shops of W. T. Goolden & Co. In 1893 he was in charge of an electrical coal-cutting plant in Durham, and from 1894 to 1899 was in the drawing office of Crompton & Co. at Chelmsford, the last three years as head draughtsman. He then joined the staff of Sir Alexander Kennedy, preparing plans in connection with generating stations, and became his resident engineer at Grimsby, superintending the erection of the plant there. From 1901 to 1927, Colonel Vignoles was electrical engineer to the Grimsby Corporation, this period being interrupted by war service in the infantry from September, 1914 to February, 1919, during which he served in France for 2¼ years, receiving the D.S.O. and bar, and being twice mentioned in despatches. At Grimsby, he carried out large extensions to the plant, and after the war reorganised and brought up to date the whole undertaking. He has made a special study of the commercial side of the supply industry, and has written many papers on the subject. The result of a paper read by him before the I.M.E.A. in 1914 was the formation of the I.M.E.A. Development Committee, which had its effect upon the formation of E.D.A.

Lt.-Col. W. A. Vignoles



Mr. J. C. Needham

Colonel Vignoles was president of the I.M.E.A. for the year 1922–23, and for a number of years was engaged upon many of its committees, in addition to his membership of the Council ; he was also for many years a member of the E.D.A. Council. He is a member of the I.E.E. and served for three years on the Council. In January, 1928, Colonel Vignoles became Director of the British Electrical Development Association, in succession to Mr. J. W. Beauchamp. During his directorship he visited America to study electricity supply policy and methods, and carried the development of E.D.A. forward by the organisation of Area Committees and Circles. He resigned this position in 1931 in order to take up the position of joint managing director of Evershed & Vignoles, Ltd.

Mr. J. C. Needham, who succeeds Colonel Vignoles as senior managing director of Evershed & Vignoles, Ltd., was born in 1884. He obtained practical workshop experience with the General Electric Co., Ltd., and technical training at Finsbury Technical College. In 1901 Mr. Needham joined Evershed & Vignoles, Ltd. as an assistant in their test room, and in 1915 he became manager of one of their main departments. He was given a seat on the board of directors in 1936, and in 1939 on the retirement of Mr. A. Vines was appointed joint managing director with Colonel Vignoles.

At a recent meeting of Heywood Town Council an application from **Mr. H. C. Day**, the borough electrical engineer, for a salary increase was considered. Ald. G. H. Wild said that the works had increased two or three fold and the number of consumers had gone up five or six times and because of that it was felt that the engineer was justified in making the application. It was decided, however, that in view of the resolution of the General Purposes Committee, which had been passed by the Council, that consideration of the salaries of chief officials be deferred for the duration of the war, the matter could not be discussed further.

We regret to learn that **Mrs. C. H. Yeaman,** widow of Mr. C. H. Yeaman, late city electrical engineer of Stoke-on-Trent, has undergone an operation at the Longton Cottage Hospital. We are glad to hear, however, that Mrs. Yeaman's condition is satisfactory and that progress is being maintained.

Mr. G. H. Walton has been appointed works manager at Helsby for British Insulated Cables, Ltd., as from April 1st in succession to Mr. E. A. Bayles whose retirement we recently announced. Mr. Bayles is being retained by the company in a consultative capacity.

Mr. K. J. McKillop, whose article on the operation of Export Groups appears on page 581, has since the outbreak of hostilities held the position of secretary to the Export Group formed by the cable industry and known as the Insulated Conductors Export Group. Mr. McKillop received his technical training at the Manchester College of Technology and served his apprenticeship at the Manchester works of Laurence, Scott & Electromotors, Ltd. He then joined the London office staff of British Insulated Cables, Ltd., where for about twelve years he was engaged on the Association side of the cable business. In 1939 he joined the staff of the Cable Makers' Association in charge of the department concerned chiefly with the operation of international cartels.

Mr. K. J. McKillop

Mr. G. Mills, cable ganger with the St. Pancras Borough Council Electricity Department, has been officially commended for brave conduct in Civil Defence.

Richmond (Yorks) Town Council has approved a recommendation of the Electricity Committee that the salary of **Mr. J. B. Hood,** the borough electrical engineer, be increased from £270 (house and rates free) to £330 a year and thence by three annual increments of £10 to £360.

Mr. F. Overstall, of Birkenhead, was appointed deputy electrical engineer by Paisley Corporation on April 15th at a salary of £590, rising to £620 per annum. Mr. Overstall is mains superintendent to the Birkenhead Corporation Electricity Supply Department. He is thirty-six years of age and is an associate member of the Institution of Electrical Engineers.

Mrs. P. Mackay has recently been appointed housecraft lecturer to the Electrical Association for Women in place of **Miss Dorothy Vaughan,** who has resigned owing to ill-health. Mrs. Mackay was formerly with the North-Eastern Electric Supply Co., Ltd., and while with the Brompton & Kensington Electricity Supply Co. (now Central London) was among the first hundred to be awarded the E.A.W. Diploma. More recently she was head demonstrator to the Revo Electric Co., Ltd.

Macclesfield Electricity Committee has decided to retain the services of the consulting engineer, **Mr. L. C. Grant,** for a period of twelve months at a fee of 75 guineas.

Mr. F. Gurney, lately manager of the sub-office at Leeds of the Metropolitan-Vickers Electrical Co., Ltd., has been appointed sales manager of the Transformer Department in place of the late Mr. G. E. Gittins. **Mr. R. P. Horlock** has been appointed to succeed Mr. Gurney as manager of the Leeds sub-office.

Mr. T. H. Watermeyer, M.Inst.C.E., A.M.I.E.E., who in 1933 became general manager of South African Railways and Harbours, Johannesburg, has retired.

Obituary

Dr. G. W. C. Kaye.—We regret to record the death of Mr. George William Kaye, O.B.E., F.R.S., M.A. (Cantab.), D.Sc. (Lond.), F.Inst.P., superintendent of the Physics Department of the National Physical Laboratory, which occurred on April 16th at the age of sixty-one. Educated at the Royal College of Science and at Trinity College, Cambridge, Dr. Kaye had held many important offices. He was president of the Röntgen Society in 1917–18; visitor and manager of the Royal Institution, 1929–35 and 1939–41; secretary of the International X-ray and Radium Protection Committee since 1928; Silvanus Thompson lecturer and medalist, 1935; and president of the British Institute of Radiology, 1928–29. He was also a member of the National Radium Commission, 1929-33, and secretary from 1935–39; chairman of the Noise Investigation Committee, Ministry of Transport; and president of Section A, British Association, 1937. During the last war he served in the Royal Engineers (T.) From 1917 to 1920 he was Inspector of Materials at the Air Ministry.

Lord Stamp.—It is with regret that we have to record the death, by enemy action, of Lord and Lady Stamp and their eldest son, the Hon. Wilfrid Stamp. Lord Stamp was elected president of the British Electrical & Allied Industries Research Association in 1939 and held that office at the time of his death. He was also a member of the Export Council, president of the London, Midland & Scottish Railway, and he was president of the British Association in 1936.

The late Lord Stamp

Mr. C. A. Stone.—The death is reported of Mr. Charles A. Stone, co-founder and chairman of Stone & Webster, Inc., which, since 1889, has become one of the most important constructional engineering concerns in the United States, particularly in the utility field.

COMMERCIAL and INDUSTRIAL NEWS

Supply Undertakings' Employees. Control of Constructional Work

Supply Undertakings and "Essential Work"

THE position of electricity supply undertakings under the Essential Work (General Provisions) Order, 1941, which restricts the movement of labour from certain undertakings engaged in "essential work," has been considered by the Electricity Commissioners. As a result the Commissioners are taking steps to confer with the appropriate bodies representing employers and employees in the electricity supply industry.

Subject to the consideration of any views which those bodies may desire to express, the Commissioners state that it appears to them that there is a *prima facie* case justifying them in representing to the Minister of Labour that authorised electricity undertakings could properly be regarded as engaged in essential work and that all such undertakings should be entered in the schedule with a continuing or provisional basis, according as the Minister is satisfied in individual cases on the matters referred to in Article 3 of the Order. This article deals with such matters as terms and conditions of employment and the welfare and training of employees.

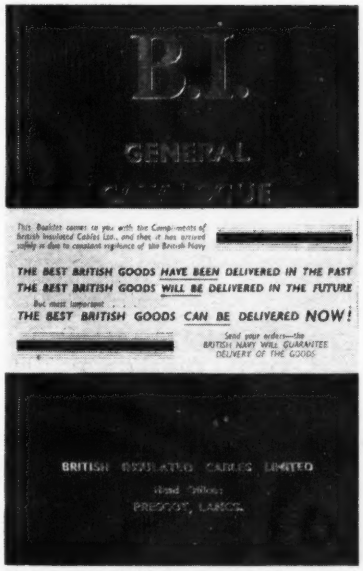
Authorisation of Works

The Electricity Commissioners have drawn the attention of authorised electricity supply undertakings to the new Order in Council (S.R. & O. No. 437) amending the previous Order dealing with the control of building or constructional operations. This reduces, as from April 14th, the limit below which no authorisation is required from £500 to £100, but works costing between £100 and £500 commenced before April 14th may be proceeded with. Works carried out in the same building within a period of twelve months are to be aggregated for authorisation purposes. It is now made clear that works required for the provision of water, light, heating or other services are included in the definition of building or constructional operation.

Power is conferred to enter and inspect premises to ascertain whether any conditions attached to the authorisation are being complied with. The Commissioners state that the general provisions as to procedure set out in their letter of October 31st, 1940, will continue to apply.

Britain Delivers the Goods

As a reminder to overseas buyers that British goods, unlike those manufactured by Germany and Italy, can be delivered to their required destination, British Insulated Cables, Prescot, Lancs., are attaching a special binding strip to all copies of their new abridged general catalogue which has just been issued in the endeavour to develop the export business for all the company's products.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The new B.I. abridged general catalogue with special binding strip emphasising Great Britain's ability to fulfil export orders

Fire Prevention Measures

In connection with the Fire Prevention (Business Premises) Order, 1941, the Home Secretary and Minister of Home Security has issued an explanatory memorandum and a pamphlet laying down normal minimum standards for trade and industry. The latter refers to the employment and posting of watchers and communication between them and fire bomb parties or works control.

Fire bomb parties should consist of three persons and should be ready for action if local danger appears imminent. A scale is laid down for the number of fire parties necessary for buildings of various types and roof area and the equipment for each party is specified. The provision of water, sandbags and extinguishers inside and outside the premises is dealt with and the method of calculating the amount of water required for pumps is given, together with notes on water supplies generally.

The pamphlet concludes with a drawing of a suitable form of protective shield which can be easily constructed from $\frac{1}{4}$ in. mild steel plate or $\frac{7}{8}$ in. deal backed by a 22 SWG sheet iron plate.

Welfare Workers for Industry

Recent utterances by the Minister of Labour have served to stimulate interest in industrial welfare work and many firms are now considering the appointment of a welfare or personnel worker. Unfortunately many of those so appointed know little or nothing of the duties involved and are without any previous factory experience. Some months ago the Ministry gave approval and financial support to suitable courses on the subject at the universities of Birmingham, Cambridge, Edinburgh and Liverpool, as well as practical training in the welfare departments of factories. As a result a number of qualified candidates, both men and women, are now available to take up posts in industry. The Industrial Welfare Society, therefore, suggests that employers and others who contemplate making appointments of such persons should first communicate either with the Factory and Welfare Department of the Ministry of Labour, Cleland House, Paige Street, S.W.1, or the Society, 14, Hobart Place, S.W.1.

Fatality Sequel

At the Liverpool Assizes recently, before Mr. Justice Asquith, a settlement was announced relating to the death from electric shock of Eric Teece Millington, aged thirty-two. Chester Corporation, while denying all liability, agreed as an act of grace to pay £750, with costs, to the widow, Mrs. Alice Millington. Mr. N. B. Goldie, for the widow, said that the widow had originally sued also in the action her husband's employers, Callender's Cable and Construction Co., Ltd. The case would have involved a great deal of investigation into law as to responsibility. In October, 1938, a blizzard brought down an enormous number of wires, and the Corporation obtained the help of Callender's in repairing the damage. At Mollington a foreman ordered Millington to go up a pole to mend a neck. The foreman went a little down the lane and discovered that the line had a back-feed. Before he could rush back Millington had touched the "live" wire and had been instantly killed. The sum now paid was £200 more than could have been obtained as workman's compensation.

Mr. G. J. Lynsky, K.C., for the Corporation, said that Callender's installed the system and had maintained and repaired it for the past thirty years. Unfortunately their foreman forgot for the moment that there was a back-feed.

G.E.C. lighting fittings have been installed in the new official residence of General Smuts, the South African Prime Minister

Earthing Clamps

Performance, rather than mechanical design, is the basis of BS.951 for electrical earthing clamps and clips intended to be fixed to metal pipes of internal diameters up to 3 inches. Nevertheless some mechanical features have been specified; for instance, the connection of the earthing wires to the clamps must not be made by means of the screws which are themselves employed for tightening the clamps on the pipes. A range of sizes has been standardised and both resistance and torque tests are prescribed. An appendix explains the relation between the internal and external diameters of copper, iron or lead water pipes and steel or copper electrical conduit, which enables the appropriate size of clamp to be ascertained for any particular pipe. BS.951 satisfies the clause 3 requirements of the Institution of Civil Engineers' 1938 regulations for electrical earthing to water mains. Copies of the new specification are obtainable from the British Standards Institution, 28, Victoria Street, London, S.W.1., price 2s. 3d. each.

Fluorescent Lighting Installations

An interesting fluorescent lighting installation has recently been designed by Crompton Parkinson, Ltd. A vital chemical process in a Government factory involves the addition of acids to a liquid solution by carefully controlled stages, as a result of which the liquid changes in colour. These changes determine the point at which further acid is added. The operation is so critical that it could normally only be carried out under the most favourable daylight conditions. The introduction of the fluorescent tubular lamp promised an opportunity of providing controlled light closely resembling daylight. Investigation showed that an illumination of 120/150 ft.-candles over a working area of 6 ft. by 4 ft. 6 in. would be necessary to provide sufficient illumination to enable the delicate changes in hue to be easily discerned. A special

fitting was therefore designed to accommodate four 80-W "Crompta" tubes and was mounted at a height which ensured that the light source was not in the line of vision. As aluminium was not obtainable the reflector was constructed of sheet brass with a chromium plated reflecting surface, the exterior being painted with acid resistant material.

The recent issue of an Order by the Ministry of Supply and Ministry of Labour defining the amount and quality of light required in industry serves to focus the attention of the public on the fact long known to lighting engineers, that good lighting is an absolute essential of efficient production, particularly in wartime. The availability of the new 5-ft. fluorescent lamps with their highly efficient and diffused lighting greatly simplifies the fulfilment of the conditions laid down by the order. There are many installations throughout the country where the standards of illumination are exceeded both in quantity and quality of light by using this new lamp. Amongst them are those of Manfield & Sons, Northampton,

"Mazdalux" reflectors, housing Mazda 80-W, 5-ft. fluorescent lamps in the finishing room at John White's factory, Rushden

where Mr. V. W. C. Jupp has been responsible for the installation; John White, Rushden (contractors : Central Electric Co.); and the Brooke Manufacturing Co., Northampton (contractors: E.M.F. Electrical Co.) In all these cases B.T.H. "Mazda" fluorescent lamps were employed.

Flameproof Certification

The customary quarterly list of apparatus, mining and industrial, in respect of which certificates of flameproof enclosure have been granted by the Mines Department during the three months ended March, 1941, is now available. A few copies can be purchased for 1s. 2½d. each post free from the Mines Department, Heyhouses Lane, Lytham St. Annes, Lancs.

The list is much shorter than usual, and briefly describes varied products of six manufacturers.

British Claims against Enemy Ships

Persons having claims against enemy ships, shipowners or charterers (except claims for the release of British-owned cargoes on German ships which are still in neutral ports) are reminded that under the Cargoes and Claims (Information) Order, dated August 29th, 1940, (S.R. and O. 1940, No. 1568), they are required to report particulars to the secretary, Enemy Shipping Claims Committee, Norman House, Strand, London, W.C.2. Persons not sending the required particulars are liable to heavy penalties under the Defence Regulations. The term "enemy" for the purpose of the Order now includes Roumania and Bulgaria.

Trading with the Enemy

The Board of Trade announces that it has made a new Order which comes into force on April 17th containing 176 additions to the "black list" of traders in neutral countries with whom it is unlawful to have dealings of any kind. Further additions will be made in due course. The Order is being published by H.M. Stationery Office under the title of the Trading with the Enemy (Specified Persons) (Amendment) (No. 5) Order, 1941 (Statutory Rules and Orders, 1941, No. 458).

The Board of Trade also announces that Hungary is enemy territory for the purpose of the Trading with the Enemy Act. It is accordingly a punishable offence to have commercial, financial or other intercourse or dealings with or for the benefit of any person in that territory. Inquiries should be addressed to the Trading with the Enemy Branch, 24, Kingsway, London, W.C. 2.

Extension of Export Control

Under a Board of Trade Order which comes into force on April 30th, goods classified "C" n the Export Control List will require licences for export to China, Macao, Portuguese Timor and Thailand. The Order (S.R. & O. 1941 No. 523) also prohibits the export without licence to all destinations of certain textile machinery and plant.

Force-Trip Devices

In the inscription to the illustration of Mr. R. T. Lythall's article on "Force-Trip Devices" in our issue of April 11th we described the wave as fully symmetrical. This should, of course, have read fully asymmetrical.

Distribution of Steel Supplies

The Iron & Steel Control's booklet "Distribution of Steel Supplies, No. 3, Customers," directed that application for steel authorisations should be addressed to the Government Department under whose responsibility the steel was to be used. From now on, applications from certain raw material industries will be dealt with by the appropriate Controller.

In the case of non-ferrous metals, application forms for authorisations of steel for the manufacture of new plant and machinery, the maintenance and repair of existing plant, and packages and containers, to be used in processes of manufacture of non-ferrous metals can be obtained from the Non-Ferrous Metals Control, Grand Hotel, 46 Albert Street, Rugby. The processes referred to are:—(1) The mining, melting and refining of copper, lead, zinc and tin, including the treatment of ores, residues, &c., for the recovery of metal. (2) The casting, rolling, drawing and extrusion of copper, lead and zinc, brass and other alloys of copper, but not including die castings or the milling of powders from these metals. In the case of the production of nickel, antimony, platinum, and other miscellaneous non-ferrous metals not included under (1) and (2) applications should be sent to the Ministry of Supply, R.M.1c, The Castle, Warwick. In connection with iron, steel and ferro-alloys, application forms for authorisations of steel for the manufacture of new plant and machinery, the maintenance and repair of existing plant, and packages and containers to be used in processes of manufacture of iron and steel can be obtained from the Iron and Steel Control, Ashorne Hill, Leamington Spa. For plastics, application forms for authorisations of steel for the manufacture of new plant and machinery, the maintenance and repair of existing plant, and packages and containers to be used in processes of manufacture of plastics can be obtained from the Controller of Plastics, Great Burgh, Epsom.

The "Henley Telegraph"

In the Spring number of the "Henley Telegraph" Mr. W. F. Bishop, director and general manager of Henley's, is in reminiscent mood and traces back the social life of Henley's staff to the beginning of the century. He mentions that at the last annual dinner of the staff (1938) seven hundred were present. We look forward to the early resumption of this pleasant function. The rest of the contents of the "Telegraph" are on the usual high plane. It is interesting to see that Dr. Vaughan Williams has taken the Henley choir in hand; under his leadership there should be some good results.

Trade Announcements

Flinders (Wholesale) Ltd., inform us they have opened new premises at 34, Bridge Street, Cambridge.

New Catalogues and Lists

Amplivox, Ltd., 2, Bentinck Street, London, W.1. — Leaflet descriptive of a lightweight piezo-crystal deaf-aid microphone.

J. H. Randall & Son, Ltd., North Wharf Road, Paddington, London, W.2.—A calendar of black-out times for April to December.

Londex, Ltd., 207, Anerley Road, London, S.E.20.—Leaflet No. 91 describing the Londex roof spotter system utilising the company's types LF, LQA and ML sensitive relays.

TRADE MARK APPLICATIONS

AMONG recent applications for British trade marks are the following, objections to which may be entered within a month of the dates mentioned:—

April 9th

CONTINENTAL MOTORS—AMERICA'S STANDARD—POWERFUL AS THE NATION (design). No. 612,151, Class 7. Portable and stationary combinations of internal combustion engines with electric generators; electric generators and parts thereof; and electric motors and parts thereof. Also No. 612,152, Class 9. Battery chargers, storage batteries, wire for electrical purposes, switches, electrical connections and parts of these goods. Continental Motors Corporation, 12801 Jefferson Avenue East, Detroit, Michigan, U.S.A. Address for service: c/o Frank B. Dehn & Co., Kingsway House, 103, Kingsway, London, W.C.2.

MAZDALUX. No. 613,813, Class 11. Apparatus for attachment to reflectors for regulating and diffusing light. The British Thomson-Houston Co., Ltd., Crown House, Aldwych, London, W.C.2.

April 16th

Design No. 614,273, Class 9. Photographic flashlight lamps. Philips Lamps, Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by our Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the following:—

FLASHHEET immersion heaters.

Electrical Manufacturing in 1940

B.E.A.M.A.'s Annual Report

ALTHOUGH the war activities of the British Electrical & Allied Manufacturers' Association have been many and varied the report for the past year deals mainly with the classes of work in which the Association has been normally engaged in the past.

At the request of the Export Council of the Board of Trade, the Association undertook the formation of Export Groups covering the whole of the material dealt with by the Sections of the Association. As the range of manufactures to be covered was extremely wide, two main organising committees were established for (A) *Electrical Machinery* (under the chairmanship of the Director, Mr. V. Watlington) and (B) *Electrical Goods and Apparatus* (under the chairmanship of the Deputy Director, Mr. C. Rodgers). Some other special Groups working in conjunction with the Association were also set up.

Twenty-two Export Groups have been established, eleven of them under the auspices of the Electrical Machinery Committee, and eleven under the Electrical Goods and Apparatus Committee. Each Group deals with a particular class of manufacture corresponding generally with the divisions indicated by the Sections of the Association. A special department has been set up at the Association's headquarters to deal with all questions regarding the supply of materials used in the manufacture of exported articles.

The Purchase Tax came into effect on October 21st, 1940. Owing to the great diversity in the electrical articles scheduled and the different channels through which those articles are distributed, it became evident that considerable difficulties and complications would arise in administering the Act, unless those engaged in the electrical industry collaborated with the authorities.

A "Purchase Tax Electrical Industry Committee" was accordingly set up. All the interested associations in the electrical industry are represented on this Committee: manufacturers, wholesalers, contractors and electricity supply. Each organisation represented carries out its own negotiations with the Customs Authorities as to which individual articles come under the respective schedules and the simplest way of assessing the tax in each case. All these negotiations are co-ordinated in the Committee.

The Director is chairman of the Committee, and the B.E.A.M.A. provides all secretarial services. The Committee has been of great assistance to the industry and the Customs authorities.

The Contract Conditions Committee has met regularly to deal with contract clauses and other matters arising out of the present conditions. Revised I.E.E. Conditions "C" "For Goods other than Cables (Home without Erection)" have been published.

The Technical Committees

During the past year the work of the technical committees has been confined to those subjects which are of immediate importance and the production of those specifications which are required in the present emergency. Most of the work has been carried out by correspondence in order to save the time of the engineers concerned. The Standardisation Committee has not held any meetings, but the members have been kept informed of the progress of the work. In some matters of direct war importance a working liaison has been established with the appropriate Government Departments.

The new specification for AC oil circuit-breakers (up to 660 V maximum) was issued by the B.S.I. as a War Emergency Specification (No. 936/1940) with a foreword indicating that a number of points were not yet fully agreed but would be considered and a revision published as soon as conditions permitted.

Various amendments have been proposed to the specifications for three-phase oil circuit-breakers (B.S. 116/1937, Part I, up to 500 mVA, and Part II, above 500 mVA) but these will not be proceeded with at present as they do not affect any question of principle and were prepared mainly to co-ordinate the scope of this specification with those of the new specification, B.S. 936, and to bring certain features up to date.

A revised edition of the specification for flameproof enclosures (B.S. 229/1940: Part I, Apparatus for Use in the Coal-Mining Industry) was published in December, 1940. The specification now incorporates detailed requirements for those features in design and construction which are considered to be essential or desirable for flameproof enclosures in electrical machinery and apparatus for coal mining. Part II of the specification is to deal with the requirements for flameproof gases and vapours other than those in coal mining, but it has not been practicable to commence this work.

B.S. 142/1927 for electrical protective relays is being revised by the Relay Technical Committee in view of the considerable development which has taken place in relays since the issue of this specification in 1927. The new edition will be issued as soon as possible.

A new edition of B.S. 90/1929 for graphic (recording or chart recording) meters, ammeters, and wattmeters, has been published by the B.S.I., embodying the proposals prepared by a special Technical Committee of the Instrument Section. B.S. 89/1937 for indicating meters, voltmeters, wattmeters, frequency and power factor meters has been amplified by the issue of a War Emergency Slip, providing for the temporary use of substitute bearings. A Technical Committee of the Meter Section prepared the draft of a new specification for prepayment meters, which was submitted to the B.S.I. Under present conditions the discussions could not be completed, and the work has been left in abeyance.

A revision of B.S. 367/1932 (Performance of Ceiling Type Electric Fans) has been prepared by a special committee, and is now under consideration by the B.S.I. The revised specification will be issued in the near future. A special committee has been set up to prepare a revision of B.S. 380/1939 (Performance of Desk Type Electric Fans) on similar lines.

Motor Control Gear

A new edition of B.S. 587/1938 for motor starters and controllers and resistors employed therewith (excluding liquid starters and controllers and single-phase AC models) was issued in August, 1940, embodying additional matter prepared by the Technical Committee of the Motor Control Gear Section, including a mechanical endurance test, a new appendix on clearances and creepages for motor control gear, and additions to the clauses dealing with the rating of starters and the rating of rheostatic controllers. This is not a complete revision of the specification.

A revised edition of B.S. 173/1938 for traction motors, which will take the form of a comprehensive specification for rotating machinery used on traction vehicles, has been under preparation for a number of years, and has now passed through all its stages and been finally approved. The new specification will be published by the B.S.I. in the near future.

The Mercury Arc Rectifier Committee of the Association has prepared a final draft of a specification. A number of points have still to be decided but it is hoped to complete the work despite present conditions.

The revision of B.S. 546/1934 for two-pole and earthing pin plugs and socket outlets, has been postponed until more normal conditions return. A revised edition of B.S. 52/1936 for bayonet lamp cases, lampholders and lampholder-plugs for voltages not exceeding 250 V, will shortly be published including new clauses standardising dimensions for all insulated lampholders, s.b.c. type, and certain other amendments. It has, however, been found impossible under present conditions to complete the discussion affecting the protecting shield and the subject has been deferred.

Overseas students employed in members' works during 1940 numbered 158. These students came from almost all parts of the world not in enemy occupation.

The *News Sheet* has continued to be issued at intervals in order to acquaint members with wartime regulations as published. It is now distributed not only to B.E.A.M.A. members but also to each member of the various Export Groups.

The Electrical Fair Trading Council continues to meet regularly on matters concerning the Fair Trading Policy. The Policy itself continues to gain in popularity and during the past year in particular has been of considerable assistance to the Government Departments and to all sections concerned with the various Government Orders and enactments arising from the present conditions.

The Electric Light Fittings Association (E.L.F.A.), which works in close co-operation with the B.E.A.M.A. has been most active in the past year particularly in connection with the measures recently introduced by the Ministry of Supply and the Ministry of Labour, for augmenting the illumination levels in factories throughout the country. The E.L.F.A. also continues to be active in respect to the many problems appertaining to A.R.P. lighting.

Refrigeration Associations

During the past year three associations dealing with refrigeration have been set up under the auspices of the B.E.A.M.A.: the Domestic Electric Refrigeration Association which deals more particularly with domestic refrigerators; the Commercial Electric Refrigeration Association which deals with commercial electric refrigerators up to 3 HP; and the Refrigeration Insulation Manufacturers' Association which deals with industrial refrigeration and cold storage chambers.

An association comprising manufacturers and direct importers of X-ray equipment was formed during the past year working under the auspices of the B.E.A.M.A. It has established trading conditions applying to this class of work, and has carried out negotiations with the Ministry of Health and the Ministry of Works and Buildings for the maintenance of X-ray equipment coming under the authority of the Ministry of Health in all parts of the country.

An Arc Welding Electrode Section of the Association, comprising thirteen firms, has been established. During the past year thirty-five new members have joined the Association.

B.E.A.M.A. Annual Meeting

Mr. L. W. Smith Elected Chairman

THE thirtieth annual general meeting of the British Electrical & Allied Manufacturers' Association was held at 36, Kingsway, W.C.2, on April 17th. Mr. J. L. Wilson, chairman of the Council, presided, and the annual report (reviewed on the preceding page) and the accounts were adopted unanimously.

In his address, the chairman referred to the brevity of this year's report compared with those of former years. He assured members that that was a measure of the shortage of paper and not of any reduced activities on the part of the Association. The advent of Sir Andrew Duncan to the Presidency of the Board of Trade a year ago and the formation of the Export Council led to a great stimulation of the country's effort in export trade, with the result that two main Electrical Groups were formed, under the auspices of the B.E.A.M.A., to deal with the export problems first of the heavy apparatus, under the chairmanship of Mr. Watlington, and then of the lighter apparatus, under the chairmanship of Mr. Rodgers.

A great deal of work had been entailed in the formation and operation of those Export Groups, to the membership of which all manufacturers were welcomed, whether they were members of the B.E.A.M.A. or not, and during the year under review signal service was rendered by the special department set up by these Groups to secure the necessary materials to fulfil export contracts.

The work of the Contract Conditions Committee was confined to a very short paragraph in the report. This was a Committee of very long standing, and many of them knew that its work had been of a most complicated character, such as dealing with the problems of equitable compensation to the manufacturer for the ever increasing costs of labour and materials, the conditions for carrying out war damage reconstruction work, the incidence of War Risks Insurance, and all the other questions which arose and made necessary new provisions for sharing equitably between purchaser and contractor the burdens and risks of wartime trading.

The Purchase Tax Committee was a newly formed body of the B.E.A.M.A. and other electrical associations, to deal with the intricacies of the Purchase Tax and to assist the Customs authorities in the equitable administration of the Act. The Technical Committees had continued to carry out their work in spite of the difficulties of holding meetings, and the record of their work was set out in the report.

The remaining items in the report spoke for themselves, but members would note with interest the formation during the past year of Associations dealing with refrigeration and with X-ray equipment and also a Section dealing with arc welding electrodes.

Difficulties of transport and the necessity of members of the Council devoting their increasing energies to turning their companies' products to the nation's needs had led to somewhat fewer Council meetings during the past year, but that in no sense reflected any diminution of interest or co-operation for the present or future welfare of the B.E.A.M.A. and the great industry which it represented.

The chairman then announced the result of the ballot electing six members of the Association to be members of the Council for the session 1941-42. The following members were elected members of the Council : The English Electric Co., Ltd.; the Micanite and Insulators Co., Ltd.; Brookhirst Switchgear, Ltd. ; the Brush Electrical Engineering Co., Ltd. ; the Hackbridge Electric Construction Co., Ltd. ; and Hick, Hargreaves & Co., Ltd.

A vote of thanks to the chairman was proposed by Mr. E. G. Batt, who referred with appreciation to his work and that of the Council during the past year. He said that in looking at the report there was one feature that was particularly gratifying, that was, that the membership had increased so much during the year. The obtaining of thirty-five new members was a very good achievement, and it was in accordance with what he had said at the last annual general meeting regarding the desirability of an increase in the membership of the Association. Mr. A. Wynne seconded the vote of thanks and the resolution was carried with acclamation.

New Chairman

At the subsequent meeting of the new Council Mr. L. W. Smith (managing director, Elliott Bros. (London), Ltd.) and Mr. J. L. Wilson (director, British Thomson-Houston Co., Ltd.) were unanimously elected chairman and vice-chairman respectively for the next session.

The new Chairman is the son of Mr. W. O. Smith who was himself chairman of B.E.A.M.A. from 1919-1922. This is the first occasion on which a son has succeeded to the chairmanship after a full period of office by his father. It marks an event which is unique in the history of trade associations and recalls the many years of service to the industry behind the organisation of the B.E.A.M.A.

ELECTRICITY SUPPLY

Glasgow Coal-handling Plant. St. Marylebone Order.

Accrington.—SUPPLY TO BUNGALOWS.—The Corporation Electricity Committee is to provide electricity to 200 temporary bungalows at Huncoat at a cost of £2,500.

Burton-on-Trent.—SUPPLY TO LULLINGTON.—The Corporation Electricity Committee has obtained sanction to borrow £799 for extensions to Lullington.

Darlington.—DISTRIBUTION APPARATUS.—The Town Council has received sanction to a loan of £6,526 for electrical distribution apparatus.

Dorchester.—MAINS AND SERVICES.—The Corporation Electricity Committee is seeking sanction to borrow £350 for mains and services.

Glasgow.—MAINS EXTENSIONS.—The Corporation Electricity Committee has decided that extension of mains for distribution shall be laid at a cost of £2,269.

COAL HANDLING PLANT.—The manager reported to the last meeting of the Corporation Electricity Committee that it would be necessary to supplement the existing coal storage accommodation at Dalmarnock power station, involving the provision of additional electrically-operated coal handling plant. The Sub-Committee on Works agreed that the offer by Mavor & Coulson, Ltd., amounting to £11,703, be accepted for the plant, and that the preparatory work, including the clearing of the site and the provision of the necessary cabling be carried out by employees of the Department at an estimated cost of £297.

CAPITAL EXPENDITURE.—The manager also reported it would be necessary to incur capital expenditure on specified works to the extent of £34,755 (including the coal handling plant) and on unspecified works to the extent of £48,000. The Sub-Committee approved and instructed the Town Clerk to make application to the Electricity Commissioners for consent.

Grampians.—BROADCAST PROTEST AGAINST SCHEME.—A strong protest against the application of the Grampian Electricity Co. for a Provisional Order for the development of the water power of Glen Affric and Glen Cannich was made recently by Dr. Evan M. Barron in a broadcast in the Forces programme. Referring to previous applications of this kind, Dr. Barron said that the present application, however, had excited much more bitter feeling than any of these, largely because it had been put forward at so grave a time as the present. All manner of people from the Highlands would have to attend the inquiry and give evidence, and a big array of counsel and solicitors would be engaged. The amount of time and energy which would thus be taken up would be enormous, to say nothing of the heavy expense to which local authorities and public and private interests in the Highlands would be put.

Postponement of Purchase

UNDER the Special Enactments (Extension of Time) Act, 1940, the Electricity Commissioners have made Orders postponing for three years the dates of exercise of purchase rights by municipal authorities in respect of the following undertakings:—Melton Mowbray Electric Lighting Order, 1898 (Melton Mowbray Electric Light Co., Ltd.); Ossett Electric Lighting Order, 1898 (Electrical Distribution of Yorkshire, Ltd.); Kingsbury Electric Lighting Order, 1905 (Northmet Power Co.); and Pontefract Corporation Electric Lighting Orders, 1907 and 1912 (Yorkshire (West Riding) Electric Tramways Co., Ltd.). The purchase rights under the Salisbury Electric Lighting Order, 1895 (Salisbury Electric Light and Supply Co., Ltd.) have been postponed for one year.

London.—FULHAM.—The Borough Council Electricity Committee has obtained sanction to borrow £160,000 for the purchase of two sea-going colliers for the transport of coal to the power station.

ST. MARYLEBONE.—The Borough Council's Electric Lighting Act of 1904 stipulates that charges for electricity must be fixed annually in advance. As war conditions have rendered this system unsatisfactory an Order has been made under the Defence Regulations permitting the Council, with the approval of the Electricity Commissioners, to increase its charges within the limits set by the Act, in order that the revenue may cover the estimated expenses.

ISLINGTON.—The Borough Council Electricity Committee has approved estimates of £8,000 for mains and services, £3,500 for substations and £3,000 for meters.

West Sussex.—SCHOOL SHELTER LIGHTING.—The Education Committee has decided that head teachers should be informed that lighting systems installed in school shelters must be disconnected from the main source of supply unless they comply with the British Standard Specification and the requirements of the local electricity supply authority.

Wallasey.—CHARGES TO DAMAGED PREMISES.—The Town Council, at its May

meeting, will give consideration to a proposal for the withdrawal of the special concession in respect of electricity charges to consumers who are compelled to use artificial light during daylight hours owing to their windows being boarded up as the result of enemy action. It is understood that the proposal to rescind the resolutions granting the concessions, has been put forward owing to the difficulties of applying the scheme in individual cases and that a new system will be introduced allowing a 7½ per cent. reduction in lighting accounts (including prepayment fee) in genuine cases. Application for the allowance will still have to be made by the individual consumers affected. The new scheme will apply to shops.

Wolverhampton.—SCHOOL SHELTER LIGHTING.—The Corporation Education Committee has arranged for the Electricity Department to provide low voltage lighting in school shelters by transformers at a cost of £3,500.

Overseas

Canada.—ST. LAWRENCE POWER SCHEME.—The recent agreement signed by Mr. Mackenzie King, the Canadian Prime Minister, and Mr. J. Pierrepoint Moffat, the United States Minister to Canada, provides for the deepening and development of the St. Lawrence River to produce 3,000,000 HP of electrical energy. Constructional work, which will start very soon, in the International Rapids section of the river, is estimated to cost £65,000,000. The defence aspects of the scheme are emphasised in Notes exchanged by the two Governments. Welcoming the signing of the agreement, President Roosevelt stated that the United States Government regarded the scheme as a matter of vital necessity, since the demand for power was running ahead of expectations. One of the more serious handicaps to the rapid expansion of aircraft manufacture was the difficulty of finding the large supplies at high load factor required for aluminium production. They were, of course, expanding their electrical facilities for this purpose as fast as practicable, but by the time the St. Lawrence power was available other sources of cheap power would have been largely allocated. The waterway would also open an outlet for naval and cargo boats constructed in the Great Lake shipyards.

NEW BRUNSWICK SCHEME.—A sweeping measure to vest in the New Brunswick Electric Power Commission full control of the operation of any electric generating plant in New Brunswick has been introduced in the Legislature by the Hon. J. G. Boucher, chairman of the Commission. The Bill is said to be designed to meet the necessity of providing an adequate and efficient supply of power for war industries. The provisions of the Bill would permit the Commission to order an increase up to the maximum output of power generated by any plant, to take over any plant, to divert, restrict or prohibit the use of any power and to apportion priorities for use of any power. This would be done by regulations made by the Commission with the approval of the Provincial Government. The Commission would also be empowered to fix the rates for any such power used under its orders. Heavy penalties, with a maximum of a $5,000 fine for a first offence, running up to a maximum of $25,000 for third and fourth offences are provided for violations of any orders of the Commission.

Eire.—REDUCED CONSUMPTION URGED.—The Electricity Supply Board has requested local authorities to reduce public lighting, and shops and business concerns have been requested to stop using electricity for window displays and advertising at night. It is pointed out that a reduction is urgently needed because coal supplies are rapidly being reduced, while the output of electricity from the Shannon scheme varies with the rainfall.

India.—HYDRO-ELECTRIC SCHEME.—By 1942 the Madras Presidency will have a third hydro-electric undertaking in operation. The scheme is to utilise the fall of 330 ft. in the passage of the Tambraparni River in Tinnevelly District in South India. By the construction of a masonry dam 176 ft. high across the river in the foothills of the Western Ghats, above Papanasam, a reservoir of 5,500 million cu. ft. capacity is being created and water will be drawn therefrom by means of two 8½-ft. pipes embedded in the dam and fitted with valves for flow control. A diversion weir located lower down the river, near the head of the Papanasam Falls, will provide a small storage of 28 million cu. ft. for daily regulation. Two 9-ft. diameter steel pipes about 3,500 ft. long will connect this with the head works. In the initial stage only one pipe is being installed. Four 66-in. penstock pipes will eventually lead the water to the power station. The gross head developed will be 330 ft. Four generating sets coupled to turbines of 9,850 HP are to be installed and a peak power of 28,000 kW is expected to be generated when the scheme is in full operation. The system will be linked to Pykara at Madura. Constructional work is already in progress.

SUPPLY TO COCHIN.—The Travancore and Cochin Governments have arrived at a tentative agreement for supplying electricity to the Cochin State from the Pallivassal electrical project. Electricity will be supplied in bulk for ten years to the Cochin Government, the period being subject to extension for an additional five years. The proposed supply, it is estimated, will meet the needs of the State and Cochin Harbour.

Mexico.—ELECTRICITY SHORTAGE FEARED.—According to the *Christian Science Monitor*, a threatened water power shortage recently caused the Federal Electricity Commission to urge that Government and industrial employees be given simultaneous vacations in May to reduce Mexico City's electricity consumption. If the capital government, industrial and commercial life were brought to a virtual standstill for two weeks, the Commission said, enough electricity might be saved to prevent a "black-out" before the rains begin about June 22nd. The city already has been put on daylight saving time, and all power is turned off between 11 a.m. and 1.30 p.m. daily.

Southern Rhodesia.—MANUFACTURE OF CONCRETE POLES.—The High Commissioner for Southern Rhodesia states (according to *The Times*) that an improved method of manufacturing reinforced concrete poles for electric standards, which reduces their cost to less than one-third of the pre-war price of steel poles for the equivalent loading, and at the same time trebles the ultimate compressive strength of concrete mixed and placed under the usual methods, has been evolved by the city electrical engineer of Salisbury, Southern Rhodesia, and his staff.

The usual methods known were too costly, and the Salisbury Electricity Department invented a jolting table and process which have been patented on behalf of the City Council. The reduced costs of production will enable electricity to be supplied more cheaply to rural areas, and will also allow of rapid expansion of the existing supply. The city itself will benefit in having more street lighting standards and distribution line supports.

TRANSPORT

Birmingham.—FARE INCREASE.—The Transport Department is to introduce a minimum fare of 1½d. on the trams and buses and increase fares up to 3½d. by ½d. The 4d. fare and all the children's fares are unchanged, but all ordinary 4½d. and 5d. fares are reduced to 4d., which is now the maximum.

Liverpool.—INCREASED FARES.—The City Passenger Transport Committee has recommended an increase of ½d. in the existing 1d., 1½d., 2d., 2½d. and 4d. fares and the abolition of the 5d. return fare. No alterations are proposed in the 3d. fare or in children's fares.

Nottingham.—SHOES FOR TROLLEY BUS POLES.—The Corporation is fitting sliding shoes in place of wheels to the poles of the trolley buses. These not only eliminate noise and reduce liability to de-wirement, but reduce flashing to a minimum. The shoes cost about £10 a set, and already nearly 40 vehicles have been equipped.

Sunderland.—SPECIAL FARES.—The Corporation Transport Committee is to issue 1½d. any-distance single tickets on trams and buses on Sundays to workmen engaged on work of national importance.

Egypt.—THREE-COACH SET FOR TRAMWAYS.—The Ramleh Electric Railway, Alexandria, has recently brought into operation a new three-coach set, entirely equipped by the Swiss Oerlikon works. The set includes two motor coaches with an intermediate coach rigidly coupled. Each motor coach has its operating cabin with an Oerlikon cam controller for direct main current control. It is fitted, in addition, with two driving motors, a set of starting and braking resistances and a trolley current collector. Wiring arrangement provides for the operation of the four driving motors from the main current by each of the controllers. Direct current is supplied at 500 V by the overhead line, and motors are wired for 250 V. As usual, the two groups of motors are started in series-shunt and the controller provides for six series coupling positions and four shunt coupling positions. In addition, controllers provide for seven braking positions, the last one being regenerative, so that the set can be electrically braked down to complete stop. By this arrangement, it is possible to drive the set of coaches by means of the controller only, without other braking device.

The motors have roller-bearings, grease being used as lubricant. Each motor has a one-hour rating of 60 HP at 15 MPH. The maximum speed is 30 MPH. The new motor coach set marks a considerable progress as regards power and speed, and this has induced the company to have the motors of their old coaches modernised by the Oerlikon Works. The transformation resulted in a 208 per cent. increase in continuous power rating, enabling the company to bring the commercial speed of its old rolling stock near to that of the new set, which, with an average of 400 yards between stops, reaches a little over thirteen miles an hour.—*Reuter's Trade Service* (Lausanne).

RADIO AND TELEPHONY

Australia.—SHORT-WAVE STATION FOR FORCES OVERSEAS.—The Australian Government proposes to erect a powerful short-wave broadcasting station to transmit news to the Australian forces overseas.

Edinburgh.—A.R.P. RADIO.—The Town Council has approved a scheme costing £10,000 for a radio scheme for the police, fire brigade, etc.

India.—TELEPHONE LINK.—It is understood that an agreement has been arrived at between the Government of India and the Nizam's Government, whereby the Hyderabad State will shortly be linked with British India on the trunk telephone system. The scheme is expected to be put in operation in the course of a few weeks. The Nizam's Government also has under consideration a scheme involving an expenditure of Rs. 2,400,000, spread over five years, to link up important business centres in the State by means of trunk lines and also to introduce a telephone system for local use in twenty-six important districts of the State.

Birmingham Electric Club

THE Birmingham Electric Club held a luncheon meeting at the Grand Hotel, Birmingham, on April 18th. The arrangements were carried through by the honorary social secretary, Mr. A. T. Haywood, and the chair was occupied by the president, Mr. J. Hamilton. About 180 members and friends were present, the address after lunch being given by Mr. Fred White, B.Sc., A.M.I.E.E., a director of the Midland Counties Dairy, Ltd., who, in the course of his short talk on "Milk," indicated some of the humours and difficulties of a "milkman." It is of interest to note that his firm has 250 electric vehicles in operation, including "pedestrian" electric vans, while he intimated that he himself, owing to petrol rationing, had transferred his allegiance to an electric car for his town journeys, finding that the average speed compared favourably with the local bus service. In thanking Mr. White for his address the president called attention to the fact that, although the Minister of Transport advocated the use of the electric vehicle where possible, the Ministry of Supply had rationed output to a small monthly figure which bore no relation to the demand and was very short of actual requirements. A collection on behalf of the E.I.B.A. was made and resulted in the sum of £5 10s.

FINANCIAL SECTION

Company News. Liquidations and Bankruptcies. Stock Exchange Activities.

Reports and Dividends

Acquisition of Dollar Stocks.—A further Vesting Order had been made by the Treasury under which a further list of American securities are to be acquired at specified prices. The list includes stock and shares of the following concerns :—American Cities Power & Light ($2.75 Class A); American & Foreign Power ($7 preferred); American Light & Traction (common); American Power & Light ($5 preferred and common); American Public Service (7 per cent. preferred); Arkansas Power & Light ($6 and $7 preferred); Babcock & Wilcox; Central Illinois Public Service ($6 preferred); Cities Service Co. ($6 preferred and common); Columbia Gas & Electric (common); Commonwealth & Southern ($6 preferred); Electric Bond & Share (common); Electric Power & Light ($6 preferred); Electric Storage Battery (common); International Paper & Power (common); Jersey Central Power & Light (7 per cent. preferred); Kentucky Utilities (6 per cent. preferred); McGraw Electric (common); Maytag Co. ($3 preference); Minnesota Power & Light (7 per cent. and $6 preferred); National Power & Light (common) ; New England Public Service ($7 preferred); Northern States Power (of Delaware) (7 per cent. preferred); Southern California Edison (6 per cent. preferred, series "B," 5½ per cent. preferred, series "C," and $25 shares); South-western Light & Power ($6 preferred); Stone & Webster; Utah Power & Light ($7 preferred); Utility Equities ($5.50 priority stock); West Penn Electric (7 per cent. preferred); and West Texas Utilities ($6 preferred).

The following bonds are also being acquired: American & Foreign Power (5 per cent. gold debentures, 2030); Associated Electric (5 per cent. gold bonds, 1961, and 4½ per cent. gold bonds, 1953); Cities Service Power & Light (5½ per cent. debentures, 1952); International Tel. & Tel. (5 per cent. debentures, 1955, and 4½ per cent. debentures, 1952); Interstate Power (5 per cent. first mortgage, 1957); Mississippi River Power (5 per cent., 1951); Missouri Public Service (5 per cent. first mortgage, series "A," 1960, registered and bearer bonds); Standard Gas & Electric (6 per cent. notes, extended from 1935 to 1948, and 6 per cent. series "A" debenture, 1951); and Standard Power & Light (6 per cent. debentures, 1957).

The Electric Supply Corporation, Ltd., reports net profits for 1940 of £58,118, as compared with £62,893 for 1939. The final ordinary dividend is 6½ per cent. making 10 per cent. for the year (against 11½ per cent.), and £36,087 is carried forward (against £36,095 brought in).

The Ever Ready Trust Co., Ltd., reports a net revenue for the year to March 31st of £28,293, as compared with £28,470 for 1939–40. The ordinary and deferred dividends for the year are maintained at 9 per cent., and £6,918 is carried forward (against £5,625 brought in).

The Adelaide Electric Supply Co., Ltd., is maintaining its interim dividend at 5 per cent.

The Telegraph Condenser Co., Ltd., has announced a dividend for the year of 5 per cent. (against nil).

The Electrolux Co. (Stockholm), reports a net profit for 1940 of 3,173,326 kr., after allocating 2,400,000 kr. to reserve for Swedish taxes. It is proposed to pay a dividend of 5 kr. per 75 kr. share. The balance carried forward is 16,750,530 kr.

W. Canning & Co., Ltd., report a net profit of £55,172 for 1940 (after meeting taxation) as compared with £65,891 for 1939. The ordinary dividend is maintained at 20 per cent.; £5,000 (against £10,000) is transferred to general reserve and £15,929 (against £11,500) to contingencies reserve; £3,000 is contributed to the employees' benevolent fund and £38,653 is carried forward (against £38,535).

S. Guiterman & Co., Ltd., announce a net profit of £28,376 for 1940 (as compared with £23,134 for the preceding year). The dividends on the ordinary and preference shares are maintained at 7½ per cent. £13,000 is again reserved for taxation and £3,500 transferred to general reserve, leaving £8,491 (against £4,865) to be carried forward.

Broom & Wade, Ltd., have again declared an interim dividend of 7½ per cent.

New Companies Registered

E. R. Morris, Ltd.—Private company. Registered April 4th. Capital £750. Objects : To carry on the business of electrical engineers, contractors, manufacturers of, and dealers in, electrical goods, dealers in electric and other lamps, radiators, fires and household fittings, wireless and general engineers, etc. Directors: E. R. Morris, "Glendon," Knowleston Place, Matlock, Derby, and G. E. Hooton, "Hemming Grove," Old Brampton, Chesterfield. Registered office : 5, Irongate, Chesterfield, Derby.

Barber Electrical Services, Ltd.—Private company. Registered April 5th. Capital £1,000. Objects: To carry on the business of electrical, wireless, motor, and general engineers, etc. Directors : A. A. Barber, 59, Moat Lane, Yardley, Birmingham, 26; E. C. Finding, 62, Blakesley Road, Yardley, Birmingham, 25; and W. H. Ball, 16, Newent Road, Northfield, Birmingham. Registered office : 124, Factory Centre, King's Norton, Birmingham.

Insulating Sleevings and Tapes, Ltd.—Private company. Registered April 11th. Capital £1,000. Objects: To carry on the business of manufacturers of, and dealers in, electrical insulating materials, electrical engineers' supplies, radio and telephone apparatus and supplies, etc. Subscribers : K. R. Wilcox and Mrs. E. Wilcox, both of Grant Arms Hotel, Ramsbottom, Lancs. Secretary : J. N. Bullivant, 90, Deansgate, Manchester.

C. K. B. Sales, Ltd.—Private company. Registered April 8th. Capital £100. Objects: To carry on the business of manufacturers of, and dealers in, electrical and engineering equipment and goods, torch cases, batteries, bulbs, dry cells, accumulators, etc. Directors : F. Cumber, address not stated; R. P. Koenig, 14, Hawthorn Road, Sutton, Surrey; and E. E. Bassett, 39, College Gardens, Chingford, Essex. Secretary : J. Alexander, 69, Wiverton Road, S.E. 26.

Martin's Products, Ltd.—Private company. Registered April 8th. Capital £1.000. Objects: To carry on the business of manufacturers of, and dealers in, electric torch batteries, radio batteries, dry cells, bulbs, accumulators, electrical, heating and engineering equipment, chemicals and substances for use in the manufacture of such batteries and equipment, etc. Other particulars similar to C.K.B. Sales, Ltd. (q.v.).

Imhof's (Retail), Ltd.—Private company. Registered April 12th. Capital £5,000. Objects : To carry on the business of suppliers, distributors and manufacturers of, and dealers in, radio receiving and transmitting sets and apparatus, television sets, gramophones, records, microphones, silent and talking picture apparatus, electrical appliances, etc. Directors : L. H. C. Imhof, 7, Preston Road, Copse Hill, Wimbledon, S.W., and A. G. Imhof, 254, Malden Road, New Malden, Surrey. Registered office : 112/116, New Oxford Street, W.C.1.

Leicester Battery Co., Ltd.—Private company. Registered April 12th. Capital £500. Objects : To carry on the business of manufacturers, merchants, importers and exporters of electrical goods, equipment and accessories, batteries, cells, accumulators, etc. Subscribers : L. Wolchover, 9, Meadow Way, Rickmansworth, Herts, and M. B. Lebrett, 38, Heathfield Gardens, N.W.11. Registered office : Coventry House, South Place, E.C. 2.

Cardinal Engineering Co., Ltd.—Private company. Registered April 4th. Capital £1,000. Objects : To carry on the business of electrical and mechanical engineers, manufacturers of, and dealers in, engineers' stores and requisites, aircraft parts, tools, etc. The permanent directors are : H. E. C. Brown and O. V. Price.

Lorel Engineering Co., Ltd.—Private company. Registered April 16th. Capital £100. Objects: To carry on the business of mechanical, electrical, marine, ventilating and general engineers, manufacturers of, and dealers in, tools, hardware and engineering equipment, &c. Directors: A. Sykes, New Manor Farm, East Clandon, Surrey; and L. C. Merrett, Villa d'Este, Manor Way, Guildford. Solicitors: Triggs, Turner & Co., 135, High Street, Guildford.

F. C. Smith & Co. (Transformers), Ltd.—Private company. Registered April 11th. Capital £2,000. Objects: To carry on the business of manufacturers of, and dealers in, electrical transformers, equipment, machine parts, &c. Directors: F. C. Smith, The Chilterns, St. George's Avenue, Weybridge, Surrey; and A. Hobson, 179, Bushey Mill Lane, Watford, Herts. Registered office: 18-22, Kingston Hill, Kingston-on-Thames.

Abwood Tool & Engineering Co., Ltd.—Private company. Registered April 10th. Capital £10,000. Objects : To carry on the business of manufacturers of and dealers in grinding machines, vices, drilling machines and tools, electrical, mechanical and general engineers, &c. Directors: V. J. Trow and A. C. Trow, both of 263, Long Lane, Bexley Heath, Kent; and G. A. Trow, 135, Bedonwell Road, Bexley Heath. Registered office: Harrow Manorway, Abbey Wood, Kent.

M. & B. Plastics, Ltd.—Private company. Registered April 10th. Capital £1,000. Objects : To carry on the business of importers, exporters and manufacturers of and dealers in synthetic and natural plastic materials and allied products and articles made therefrom, &c. Subscribers: H. Reynolds and H. A. Southwell, both of 7, Arundel Street, W.C.2. Solicitors: Reynolds Sons and Gorst, 7, Arundel Street, W.C.2.

D. H. Die Casting Co., Ltd.—Private company. Registered April 10th. Capital £4,000. Objects: To carry on the business of constructional, mechanical, electrical, marine and general engineers, founders, smelters, stampers, manufacturers of and dealers in machinery, &c. Directors: C. A. Honen, and Mrs. P. Honen, both of "Fairmead," Fairlight Avenue, Windsor, Berks. Solicitors: Charsley Leonard & Co., 11, Mackenzie Street, Slough.

R. E. Morley & Co., Ltd.—Private company. Registered April 12th. Capital £1,000. Objects: To carry on the business of mechanical, motor, electrical, constructional and general engineers, ironmasters, iron and brass founders, &c. Directors: R. E. Morley, 20, Green Lane, Bolton; and J. Maxwell, C.A., 1, Chancery Place, Manchester. Registered office: 1, Chancery Place, Manchester.

Companies' Returns

Increase of Capital

Walsall Electrical Co., Ltd.—The nominal capital has been increased by the addition of £1,000, in £1 ordinary shares, beyond the registered capital of £6,500.

Statements of Capital

Southern Brazil Electric Co., Ltd.—Capital £507,800 in 650,000 ordinary shares of 10s. each and 182,800 preference shares of £1 each. Return dated September 18th, 1940. All shares taken up. £3 10s. paid on 7 ordinary shares. £507,796 10s. considered as paid on 649,993 ordinary and 182,500 preference. Mortgages and charges: £756,415.

Simplex Electric Co., Ltd.—Capital £500 in 500 shares of £1 each. Return dated November 5th, 1940. All shares taken up. £500 paid. Mortgages and charges: Nil.

British Brown-Boveri, Ltd.—Capital £50,000 in 10,000 shares of £5 each. Return dated November 29th, 1940. All shares taken up.

£21,250 paid on 8,500 shares (being £2 10s. per share). £7,500 considered as paid. Mortgages and charges: Nil.

Froggatt Tirebuck Electric, Ltd.—Capital £6,000 in £1 shares. Return dated February 5th, 1941. £5,800 shares taken up. £5,800 paid. Mortgages and charges: Nil.

Wall & Attwooll, Ltd.—Capital £5,000 in 5,000 ordinary shares of £1 each. Return dated January 6th, 1941. All shares taken up. £5,000 paid. Mortgages and charges: Nil.

Bush Radio, Ltd.—Capital £80,000 in 5s. shares. Return dated January 13th, 1941. All shares taken up. £80,000 paid. Mortgages and charges: £25,836.

Stearn Electric Co., Ltd.—Capital £4,000 in 4,000 shares of £1 each. Return dated January 14th, 1941. All shares taken up. £2 paid. £3,998 considered as paid. Mortgages and charges: £18,200.

Ricardo & Co. Engineers (1927), Ltd.—Capital £21,000 in 20,000 shares of £1 each and 20,000 shares of 1s. each. Return dated January 2nd. All shares taken up. £2 paid. £20,998 considered as paid. Mortgages and charges: Nil.

Mosborough Electric Supply Co., Ltd.—Capital £5,000 in £1 shares. Return dated December 19th, 1940. 3,275 shares taken up. £3,275 paid. Mortgages and charges: Nil.

Tubes, Ltd.—Capital £215,000 in £1 shares. Return dated November 14th, 1940. All shares taken up. £107,584 paid (£1 on 82,859 shares and 10s. on 49,450 shares). £107,416 considered as paid (£1 on 82,691 shares and 10s. on 49,450 shares). Mortgages and charges: Nil.

Highgate Cable & Engineering Co., Ltd.—Capital £1,000 in £1 shares. Return dated December 9th, 1940. 600 shares taken up. £600 paid. Mortgages and charges: Nil.

Credenda Conduits, Ltd.—Capital £50,500 in £1 shares. Return dated November 4th, 1940. All shares taken up. £30,500 paid. £20,000 considered as paid. Mortgages and charges: Nil.

Receiver Appointed

Herts Radiolectric, Ltd.—A. Harris, of 329, High Holborn, W.C.1. was appointed receiver and manager on March 18th, 1941, under powers contained in debenture dated April 19th, 1941.

Mortgages and Charges

Speeds (Widnes), Ltd.—Mortgage, charged on land and buildings at Widnes, etc., dated March 31st, 1941, to secure all moneys due or to become due from the company to District Bank, Ltd.

Modern Telephone Co., Ltd.—Debenture, charged on the company's undertaking and property, present and future, including uncalled capital, dated March 12th, 1941, to secure the indebtedness of the company to the chargees including any sums hereafter advanced. Holders: Bowmaker, Ltd., Bowmaker House, Lansdowne, Bournemouth.

Page & Miles, Ltd.—Debenture dated March 19th, 1941, to secure £1,200, charged on the company's property, present and future, including uncalled capital. Holder: Mrs. R. M. Bjorkegren, Hove.

Liquidations

Metal & Electro Chemical Products, Ltd.—Winding-up voluntarily. Liquidator, Mr. H. Wylie, 32, Old Jewry, London, E.C. 2.

A.F.A. Accumulators, Ltd.—Winding-up voluntarily. Liquidator, Mr. H. Wylie, 32, Old Jewry, London, E.C. 2.

Shaftesbury Microphones, Ltd.—Meetings pursuant to section 245 of the Companies Act, 1929, on May 20th, at 112-114, Cannon Street, London, E.C.4, to receive an account of the winding-up by the liquidator, Mr. H. M. Morris.

John Baker & Son (Electrical), Ltd.—Winding up voluntarily. Liquidator, Mr. B. G. Pocock, 90, Leith Mansions, London, W.9.

Bankruptcies

A. Austen, 60, Vaughan Road, Harrow, Middlesex, lately carrying on business as Alfred Austen & Sons, electrical contractors and radio dealers, at 109, Headstone Road, Harrow.—Application for discharge to be heard on May 7th, at Bankruptcy Buildings, Carey Street, London, W.C. 2.

W. N. Bishop, electrical engineer, 39, College Avenue, Maidenhead.—Application for discharge to be heard on May 14th at the Police Court, Windsor.

R. A. J. Tully, electrician, 321, Viaduct Road, Brighton.—Trustee, Mr. A. C. Williams, 8, Old Steine, Brighton, Official Receiver, released April 7th.

H. J. Gill, electrical engineer and radio dealer, 10, High Street, Keynsham, Somerset.—Last day for receiving proofs for dividend April 25th. Trustee, Mr. H. Wheeler, 26, Baldwin Street, Bristol, Official Receiver.

T. E. Dawes (The Green Radio and Cycle Stores), electrical and radio engineer, Market Street, Oakengates, Salop.—Trustee, Mr. F. C. Ormrod, 22, Swan Hill, Shrewsbury, Official Receiver, released April 14th.

H. W. Slater (Engineering Supplies Co.), mechanical and electrical engineer, 24, Grey Street, Newcastle-upon-Tyne. First and final dividend of 16s. 8½d. in the £, payable at Gibb Chambers, Westgate Road, Newcastle-upon-Tyne.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specifications (1s. each) can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1939

11214. "Contact plug-and-socket arrangement." Telefonaktiebolaget L. M. Ericsson. April 14th, 1938. (535010.)

21477. "Short-wave wireless aerials." General Electric Co., Ltd., T. A. Julian and H. J. Shaw. July 24th, 1939. (535055.)

23877. "Control of electrically operated winding or like mechanisms." British Thomson-Houston Co., Ltd., and H. W. C. Liddiard. August 18th, 1939. (535016.)

24256. "Electrode for electrolytic devices." J. B. Brennan. August 29th, 1938. (534972.)

24326. "Television receivers." A. H. Cooper. August 24th, 1939. (534973.)

26255. "Centrifugal refrigerating apparatus." Buensod-Stacey Air Conditioning, Inc. September 30th, 1938. (535061.)

26351. "Thermostatic regulating valves." J. E. Sherlock and British Thermostat Co., Ltd. September 21st, 1939. (534978.)

26355. "Liquid immersed electric circuit interrupters." Westinghouse Electric International Co. October 27th, 1938. (534979.)

26618. "Dish washing machines." Bolinder's Fabriks Aktiebolag. September 26th, 1938. (535029.)

26706. "Lightning arrestors." British Thomson-Houston Co., Ltd. September 30th, 1938. (535093.)

27185. "Power amplifier." W. L. Maxson Corporation. July 15th, 1939. (535075.)

27658. "Operating mechanism for electric circuit breakers." General Electric Co., Ltd., G. N. Harkus and C. J. O. Garrard. October 11th, 1939. (535032.)

28047. "Automatic control or alarm devices." A. G. Lobley, Birmingham Electric Furnaces, Ltd., C. A. F. Fennell and Foster Instrument Co., Ltd. October 17th, 1939. (535080.)

28446. "Electric discharge devices." British Thomson-Houston Co., Ltd. October 24th, 1938. (535034.)

28466. "Electric switches and indicators therefor." S. D. Sullam. October 23rd, 1939. (535083.)

29209. "Emergency signals radio receiver." W. A. H. Walker. November 2nd, 1939. (535106.)

29500. "Amplifying systems for modulated high-frequency currents." British Thomson-Houston Co., Ltd. November 5th, 1938. (535086.)

30588. "Tripping arrangements for operating mechanism of electric circuit breakers." General Electric Co., Ltd., and C. J. O. Garrard. November 22nd, 1939. (535112.)

30649. "Electric cables." Pirelli-General Cable Works, Ltd., and R. E. S. Soper. November 23rd, 1939. (535113.)

30650. "Joints or terminating devices for co-axial conductor electric cables." Pirelli-General Cable Works, Ltd., and R. E. S. Soper. November 23rd, 1939. (534985.)

30658. "Starters for electric induction motors." G. Ellison, Ltd., and J. Anderson. November 23rd, 1939. (535114.)

31194. "Detection of obstacles by electromagnetic waves." Compagnie Générale de Télégraphie sans Fil. December 1st, 1938. (535120.)

31270. "Doors for ovens, stoves and the like." British Thomson-Houston Co., Ltd. December 1st, 1938. (535121.)

31923. "Carrier telephone and signalling systems." Automatic Telephone & Electric Co., Ltd., and T. B. D. Terroni. December 11th, 1939. (535124.)

32918. "Logarithmic calculators." British Thomson-Houston Co., Ltd., and H. E. G. Watts. December 27th, 1939. (535043.)

33062. "Antenna circuit modulation systems." Marconi's Wireless Telegraph Co., Ltd. December 30th, 1938. (535127.)

1940

282. "Mercury interrupters for electric circuits." General Motors Corporation. January 20th, 1939. (535045.)

384. "High ohmic resistances wound from wire." R. Bosch Ges. January 27th, 1939 (Addition to 508836.) (534987.)

879. "Stabilised tuned system for high frequency oscillations." Hazeltine Corporation. February 1st, 1939. (534988.)

1010. "Methods of making elastic fluid turbine buckets." British Thomson-Houston Co., Ltd. January 18th, 1939. (534990.)

1106. "Methods of making elastic fluid turbine buckets." British Thomson-Houston Co., Ltd. January 18th, 1939. (534991.)

1328. "Starting arrangements for induction motors." E. L. N. Towle, A. Walsh and Metropolitan-Vickers Electrical Co., Ltd. January 22nd, 1940. (534994.)

1378. "Electric signalling over power lines." General Electric Co., Ltd., E. P. L. Westell, J. Farnsworth and C. Ollerenshaw. January 23rd, 1940. (535147.)

1607. "Electric contact devices." M. Rosenfeld. January 26th, 1940. (534997.)

1820. "Electric discharge devices." British Thomson-Houston Co., Ltd. February 1st, 1939. (535000.)

1846. "Manufacture of metal clad vapour electric arc convertors of the pumpless type." General Electric Co., Ltd., and E. Gallizia. January 30th, 1940. (535152.)

3880. "Frequency multipliers for alternating current energy." Marconi's Wireless Telegraph Co., Ltd., and G. B. Banks. January 30th, 1940. (535002.)

2324. "Automatic control apparatus for use in direct current arc welding." A. Abbey (Wilson Welder & Metals Co., Inc.). February 6th, 1940. (535128.)

2435. "Internal combustion engines having oppositely moving pistons." English Electric Co., Ltd., G. H. Paulin and R. J. Welsh. February 8th, 1940. (535156.)

2450. "Electrical resistances." Chance Bros. & Co., Ltd., and L. B. H. Hallett. February 8th, 1940. (535157.)

3148. "Dry shaving and like hair cutting machines." Philips Lamps, Ltd. February 21st, 1939. (535166.)

3235. "Permanent magnets." British Thomson-Houston Co., Ltd. February 23rd, 1939. (535168.)

STOCKS AND SHARES

TUESDAY EVENING

NEWS from the Near East during the past week or so has provided no particular stimulus to the investment of money save into the Government issues made for the purpose of carrying on the war. The amount of money which flows every day into national war loans is so substantial that no surprise can be felt at the comparative lack of interest shown, by the investing public in stocks and shares outside the national circle. The Government's resolute adherence to the policy of cheap money has the effect of maintaining the prices of gilt-edged stocks of every description, as may be seen by reference to the quotations for Central Electricity, London Passenger Transport and fixed-interest stocks, the conditions of which are governed by monetary considerations. Prices of these securities now stand high ; this in itself tends to strengthen quotations for the ordinary and preference shares in front-rank industrial companies.

Financial Philosophy

A little speculation takes place in Stock Exchange markets, though this is of insufficient volume to exert any particular influence over quotations. If the news is read favourably, prices advance ; if the course of events is not so satisfactory as might be hoped, the disposition is for prices to retreat. Both rise and decline can take place in any price without a pennyworth of the stock changing hands.

Stock Exchange markets are now in a waiting condition. The first effect of the Budget, with its 10s. in the £ income tax, has given place to a feeling of financial philosophy which restrains any attempt at selling by those who hold front-rank stocks and shares. A certain amount of selling goes on every business day automatically, on behalf of deceased accounts. Other than this, the realisations are trifling, although their influence in the present dry condition of markets cannot be described as negligible.

Fluctuations in Prices

War conditions account for the comparative immobility of Stock Exchange quotations since Easter. Out of about 150 quotations given in our price-lists, only a baker's dozen would show any change this week. British Insulated ordinary, at 82s. 6d. have gained $\frac{1}{16}$, and a similar fraction has been lost by Callender's, at 61s. 3d. In the electricity supply group, the only changes of consequence are rises of $\frac{1}{16}$ in Scottish Power and Electric Supply Corporation, to 37s. 6d. xd. Northmet Power 6 per cent. preference, at 29s., have recovered the dividend deducted from the prices. British Power & Light are 6d. up at 24s. 6d. In the overseas list, Kalgoorlie shares at 12s. 6d. have gained the pence. Cable & Wireless ordinary stock hardened to 61 on the eve of the dividend announcement. General opinion looked for 4 per cent., the same as last year, but some of the optimists looked for 4¼ per cent. Globe Telegraph & Trust ordinary remained at 28s. 9d. The quietude of Stock Exchange business is aptly illustrated by this unusual want of elasticity in the week's quotations.

When Dividends Decline

The recently announced reduction of the Electric Supply Corporation ordinary dividend from 11½ per cent. to 10 per cent., has been followed by a satisfactory report, and, as mentioned above, a rise in the price of the shares to 37s. 6d. xd. Shareholders in those electricity supply and equipment companies that have lately lowered their distributions, can scarcely fail to have noticed that, in the majority of cases, the reduction has had little, if any effect upon the price of their shares. And this is because holders realise that a falling-away in the net profit is due, almost invariably, to war taxation ; they realise, too, that when this is relieved, their companies' gross profits will, if maintained, allow of the present reduced dividends to be stepped up to the previous rates. The cutting of the dividend during the war is insufficient justification for a sale of good shares.

American "Tel. and Tel."

Astronomical figures are published in the annual statement by the American Telephone and Telegraph Co. The total net income applicable to the American Telephone & Telegraph stock, was $210½ millions, an increase of over $20 millions on the year. Taxes, the British investor will observe with interest, amounted to $187½ millions, an increase of $28½ millions. The company earned rather over $10 per share in 1940. The figures possess little more than abstract interest for investors on this side, the shares being amongst those recently acquired by the British Treasury under the Vesting Order which took over a large number of American securities at fixed prices.

Adelaide and Calcutta

The Adelaide Electric Supply Supply Co. has declared an interim dividend of 5 per cent., and it is expected that the final will be at the same rate. The company's year ends with August. The dividend has ranged from 12 per cent., in 1930, to 8½ per cent. in each of the three following years, since when 10 per cent. has been distributed. Seven years ago shareholders received a bonus of 25 per cent. in stock. There is no London market in the ordinary stock. The 6 per cent. preference is quoted at 98, the 6½ per cent. C preference at 104 and the 4½ per cent. G debenture stock at 100. Calcutta Electric shares hold their rise to 37s., the demand continuing for shares upon which the dividends have been paid hitherto free of tax. This applies also to Madras Electric, whose shares can be bought at 25s. 3d. The interim dividend was reduced from 2 per cent. to 1½ per cent. If the previously paid 6 per cent. tax free were to be repeated, the yield at the present price would be £4 15s. per cent. equal, with the 10s. income tax, to 9½ per cent., though it would not be safe to bank in advance upon the dividend being maintained at 6 per cent. tax free.

Telegraph Condenser

The Telegraph Condenser Co. took over, some thirty-five years ago, the business of a private company specialising in the manufacture of electrical condensers and various instruments used in submarine telegraphy. The Admiralty is one of the company's principal customers. After a somewhat chequered career—for the year ended December, 1938, the trading account showed a loss of £8,000, whereas in 1935 a dividend of 20 per cent. was paid on the ordinary shares—the company has returned to the dividend list with 5 per cent. on the ordinary shares. The official announcement does not mention that the arrears of preference dividend will also be paid off as, of course, is the case, the preference dividend being cumulative. Shares are on offer in the Stock Exchange market at 8s. 9d., at which price the return would be 5¾ per cent. on the money, without allowing for inclusion of the dividend of 5 per cent.

B.C. Power

Dollar stocks are not particularly popular at the present time with the British investor, and the lethargic condition of the New York Stock Exchange market offers no encouragement either to speculation or to speculative investment in the shares of Canadian or American companies. This may partially account for the fact that at the moment there are on offer 1,500 British Columbia Power Corporation "A" shares at 34, paying £5 17s. 6d. per cent. on the money at that price. The British Columbia Power Corporation owns and controls some thirteen companies which collectively serve an area embracing 1,500 square miles, with a population of over 400,000 people. The business has steadily expanded during the past decade.

The company's "A" shares are entitled to a non-cumulative dividend of $2 per share per annum, in priority to the "B" shares, after which both classes rank equally for further distribution, the maximum dividend on the "A" shares being $5 per share per annum. The "A" shares are in receipt of their $2 per annum, payable as to 50 cents quarterly, the next dividend being due on April 15th. Shares can be bought in the London market, and there is a reasonably free market in them. The company owns 330 miles of electric railway lines, a motor coach service and, through various subsidiary companies, three gas plants. The dividend payments receive Dominion relief in respect of income-tax deductions.

Canadian Marconi

As a gambling counter, Canadian Marconi used to possess attraction in the days before the company grew up and declared a dividend. As invariably happens, payment of a dividend soon destroys most of the speculative interest previously attached to the shares and Canadian Marconi have been standing almost motionless round about 5s. for months past. This, the present price, is ex the dividend of 4 per cent. recently declared on these dollar shares. The yield is negligible, but the comparatively low price of the shares still seems to appeal to occasional buyers from Canada, where probably two-thirds of the capital is now held.

I.E.E. Meetings

THE annual Faraday Lecture of the Institution of Electrical Engineers, open to the public by free tickets obtainable from members, was repeated by Mr. C. E. Fairburn (electrical engineer, L.M. & S. Railway Co.) at the Western Centre, Bristol, on April 21st. This year the subject dealt with was "Electric Traction." The lecture was summarised in our issue of March 21st (p. 483).

A paper illustrated by lantern slides, descriptive of the design and construction of mercury-arc rectifiers, was read by Mr. S. H. Dale (G.E.C., Witton) before the South Midland Students' Section at Birmingham on April 23rd.

An afternoon visit to the clothing factory at Leeds of Prices Tailors, Ltd., has been arranged by the North-Midland Students' Section on April 26th.

A paper entitled "Electricity on Tap," being an examination of the possibilities of dispensing with the house-service meter, is to be read by Mr. E. Jacks (Leigh Corporation) before the North-Western Students' Section at Manchester on April 29th.

ELECTRICAL COMPANIES' SHARES

Prices, Dividends and Yields

Company	1941 Highest	1941 Lowest	Dividend Previous	Dividend Last	Middle Price April 22	Rise or Fall	Yield p.c. £ s. d.
Home Electricity Companies							
Bournemouth and Poole	48/6	45/-	15	12½	46/3	..	5 8 3
British Power and Light	27/9	23/-	7	6	24/6	+6d.	4 18 0
City of London	22/6	20/-	7½	7	21/3	..	6 11 9
Clyde Valley	36/6	33/6	8	8	35/-	..	4 11 5
County of London	34/6	30/-	10½	8	30/9	..	5 4 1
Edmundson's:							
7% Pref.	29/9	25/6	7	7	30/-	..	4 13 4
Ord.	25/6	23/6	9	6	25/-	..	4 16 0
Elec. Dis. Yorkshire	38/3	36/-	9	9	36/3	..	4 19 4
Elec. Fin. and Securities	40/-	39/-	12½	12½	40/-	..	6 5 0
Elec. Supply Corporation	37/9	36/-	11½	10	37/6xd.	+½	5 6 8
Isle of Thanet	8/-	6/-	4	4	7/-	..	—
Lancs Licht and Power	31/-	28/6	7½	7½	31/3	..	4 16 0
Llanelly Elec.	21/-	19/6	5½	5½	20/-	..	5 10 0
Lond. Assoc. Electric	16/6	12/6	5½	4½	15/9	..	5 14 3
London Electric	23/6	21/3	7	7	22/6	..	6 4 5
London Power Deb. Red.	105½	102	5	5	102½	..	4 17 6
Metropolitan	34/6	31/9	10	8	31/3	..	5 2 3
Midland Counties	35/6	32/9	8	8	35/-	..	4 11 5
Mid. Elec. Power	35/-	33/3	9	9	35/-	..	5 2 10
Newcastle Elec.	26/3	24/6	7	7	25/-	..	5 12 0
North Eastern Elec.:							
Ordinary	29/-	25/6	7	7	28/3	..	4 19 6
7% Pref.	31/6	29/-	7	7	31/3	..	4 9 7
Northampton	2½	39/6	10	10	41/3	..	4 17 0
Notting Hill 6% Pref. (£10)	9	8	6	6	8½	..	—
Northmet Power:							
Ordinary	34/6	28/6	10	7	28/9	..	4 17 4
6% Pref.	29/6	27/3	6	6	29/-xd.	+9d.	4 2 9
Richmond Elec.	18/6	18/-	6	6	18/9	..	6 8 0
Scottish Power	35/9	33/-	8	8	36/3	+½	4 8 5
Southern Areas	16/6	14/6	5	5	16/3	..	6 3 1
South London	20/-	19/3	7	7	20/-	..	7 0 0
West Devon	21/6	20/9	5	5	21/3	..	4 14 1
West Glos.	18/3	17/3	2½	4½	17/6	..	5 2 10
Yorkshire Elec.	35/3	34/6	8	8	38/3	..	4 4 0
Overseas Electricity Companies							
Atlas Elec.	2/6	1/9	Nil	Nil	2/-	..	—
Calcutta Elec.	36/3	33/-	10*	8*	37/-	..	4 6 8
Cawnpore Elec.	30/-	26/-	10	10	27/6	..	7 5 9
East African Power	25/6	21/6	7	7	25/-	..	5 12 0
Jerusalem Elec.	22/6	19/3	7	7	21/3	..	6 11 9
Kalgoorlie (10/-)	12/6	11/-	7½	7½	12/6	+6d.	6 0 0
Madras Elec.	25/3	24/6	8*	6*	25/-	..	—
Montreal Power	31	30	1½	1½	24½	..	6 2 5
Palestine Elec. "A"	20/6	17/6	5*	Nil	17/6	..	—
Perak Hydro-electric	18/3	16/3	2½	6	17/6	..	6 17 2
Shawinigan Power	18½	18	83cts.	90cts.	16	..	—
Tokyo Elec. 6%	40½	36	6	6	38½	..	15 11 8
Victoria Falls Power	76/6	69/6	15	15	75/-	..	4 0 0
Whitehall Investments Pref.	14/9	11/3	7½	7½	12/6	..	12 0 0
Public Boards							
Central Electricity:							
1950–70	110½	108	5	5	110	..	4 11 0
1955–75	112½	109½	5	5	112	..	4 9 3
1951–73	108	105½	4½	4½	108	..	4 3 4
1963–93	99½	94	3½	3½	100	..	3 10 0
1974–94	91	87½	3½	3½	92	..	3 10 8
London Elec. Trans. Ltd.	103	101½	2½	2½	94	..	2 13 2
London & Home Counties							
1955–75	107½	106	4½	4½	108	..	4 3 4
Lond. Passenger Transport:							
A	116	109	4½	4½	119½	..	3 15 4
B	110½	102½	5	5	113½	..	4 8 0
C	36	29	1½	3	31	..	9 13 6
West Midlands Joint Elec.							
1948–68	107	103	5	5	107½	..	4 13 0
Telegraph and Telephone							
Anglo-Am. Tel.:							
Pref.	102	99..	6	6	102½	..	5 17 1
Def.	24	22	1½	1½	23½	..	6 7 8
Anglo-Portuguese	17/3	15/-	8	8	16/3	..	9 17 0
Cable & Wireless:							
5½% Pref.	102	93	4½	5½	99½xd.	..	5 10 5
Ord.	63	52½	4	4	61	+½	6½ 1 3
Canadian Marconi $1	5/-	4/-	Nil	4cts.	5/-	..	3 4 0
Globe Tel. & Tel.:							
Ord.	28/3	26/-	7½*	6*	28/9	..	4 3 6
Pref.	27/6	25/-	6	6	27/6	..	4 7 3
Great Northern Tel. (£10)	14	10½	20	20	12½	..	—
Inter. Tel. & Tel.	3½	2½	Nil	Nil	3	..	—
Marconi-Marine	23/-	19/9	10	7½	22/6	..	6 13 2
Oriental Telephone Ord.	55/6	47/-	12*	11½*	2½	..	4 3 8
Telephone Props.	11/6	11/-	6	6	11/3	..	10 13 4
Telephone Rentals (5/-)	7/9	6/9	10	10	7/3	..	6 18 0

Company	1941 Highest	1941 Lowest	Dividend Previous	Dividend Last	Middle Price April 22	Rise or Fall	Yield p.c. £ s. d.
Traction and Transport							
Anglo. Arg. Trams:							
First Pref. (£5)	1/6	1/-	Nil	Nil	2/-	..	—
4% Inc.	8½	4	Nil	Nil	4½	..	—
British Electric Traction:							
Def. Ord.	830	740	5	45	800	..	5 12 6
Pref. Ord.	167	150	8	8	160	..	5 0 0
Bristol Trams	40/-	36/-	8*	8	36/3	..	4 8 5
Brazil Traction	8	6½	$1	50c.	7½	..	—
Calcutta Trams	19/9	18/6	8	5½	19/-	..	5 15 8
Cape Elec. Trams	17/6	16/6	5	5	17/-	..	5 17 4
Lancs Transport	38/-	36/-	10	10	38/9	..	5 3 1
Mexican Light:							
1st Bonds	38	34½	5	5	40	..	—
Rio 5% Bonds	85½	84	5	5	85	..	5 17 8
Southern Rly.:							
5% Prefd.	53½	43½	5	5	47½	..	10 10 6
5% Pref.	94	77½	5	5	88½	..	5 13 0
T. Tilling	43/6	34/6	10	10	42/6	..	4 14 0
Tilling & B.A.	47/6	45/6	8*	7*	45/9	..	3 1 2
West Riding	36/-	34/-	10	10	36/-	..	5 11 1
Equipment and Manufacturing							
Aron Electricity Ord.	17/6	10/-	15	Nil	18/-	+1/-	—
Assoc. Elec.:							
Ord.	41/-	38/3	10	10	40/-	..	5 0 0
Pref.	36/-	33/3	8	8	35/-	..	4 11 5
Automatic Telephone & El.	47/3	32/-	12½	12½	41/3	..	6 1 1
Babcock & Wilcox	43/3	39/-	10	11	40/-	..	5 10 0
British Aluminium	43/6	39/-	12½	10	39/6	..	5 1 3
British Insulated Ord.	88/3	78/9	20	20	82/6	+½	4 17 0
British Thermostat (5/-)	12/3	10/6	18½	18½	12/-	..	7 14 2
British Vacuum Cleaner (5/-)	6/3	6/-	40	12½	6/3	..	10 0 0
Brush Ord.	4/3	3/6	Nil	Nil	4/-	..	—
Callender's	65/6	61/-	15	15	61/3	−½	4 17 9
Chloride Elec. Storage	63/6	66/-	15	15	62/6	..	4 16 0
Consolidated Signal	65/-	63/6	17	17	65/-	..	5 4 7
Crabtree (10/-)	23/9	21/3	17½	17½	22/6	..	7 15 7
Crompton Parkinson:							
Ord. (5/-)	19/-	17/9	30	20	18/9	..	5 6 8
E. K. Cole (5/-)	4/9	2/9	10	Nil	4/6	..	—
Elec. & Musical Industries (10/-)	8/6	7/3	5	Nil	7/3	−3d.	—
Electric Construction	27/6	25/-	13½	10	27/6	..	7 5 6
Enfield Cable Ord.	51/-	45/-	16½	12½	46/3	..	5 8 3
Electrical Switchgear (10/-)	22/6	20/-	16	10	20/-	..	5 0 0
English Electric	31/6	29/-	10	10	31/3	..	6 8 0
Ensign Lamps (5/-)	16/3	15/-	25	25	15/-	..	8 6 3
Ericsson Tel. (5/-)	35/3	37/3	25*	22*	35/-	..	3 2 10
Ever Ready (5/-)	27/6	25/-	30	40	25/6	..	7 7 0
Falk Stadelmann	16/9	13/9	6	7	15/9	..	8 17 10
Ferranti Pref.	25/6	23/6	7	7	25/-	..	5 12 0
G.E.C.:							
Pref.	33/-	30/6	6½	6½	32/6	..	4 0 0
Ord.	81/-	77/-	20	20	80/-	..	5 0 0
Greenwood & Batley	21/-	18/6	15	13	20/-	..	13 0 0
Hall Telephone (10/-)	11/6	10/6	15	10	10/-	..	10 0 0
Henley's (5/-)	21/6	19/6	20	20	20/-	..	5 0 0
4½% Pref.	21/6	20/-	4½	4½	21/3	..	4 4 8
Hopkinsons	40/-	37/6	15	15	40/-	..	7 10 0
India-Rubber Pref	21/6	19/6	5½	5½	21/3	..	5 3 6
Intl. Combustion	92/6	81/3	32½	30	92/6	..	6 13 4
J. Lucas	58/-	50/6	15	15	56/3	−½	5 6 9
Johnson & Phillips	48/3	44/-	12½	15	45/-	..	6 13 4
Lancashire Dynamo	53/6	50/-	25	20	52/6	..	7 12 4
Laurence, Scott (5/-)	10/-	7/-	15	15	10/-	..	7 10 0
London Elec. Wire	25/6	20/-	7½	7½	22/6	..	6 13 4
Mather & Platt	37/9	32/-	13½	10	37/-	−6d.	5 8 1
Metropolitan Elec. Cable Pf.	22/-	21/3	5½	5½	21/3	..	5 3 6
Murex	84/6	75/-	20	20	80/-	..	5 0 0
Pye Deferred (5/-)	11/-	10/9	25	25	11/3	..	11 3 2
Revo (10/-)	21/3	18/9	17½	5	20/-	..	2 10 0
Reyrolle	52/6	7/9	12½	12½	50/-	..	5 0 0
Siemens Ord.	20/9	17/-	7½	7½	20/-	..	7 10 0
Strand Elec. (5/-)	2/-	1/-	4	2	2/-	..	5 0 0
S. Smith (1/-)	7/9	5/9	37½	50	6/3	..	8 0 0
Switchgear & Cowans (5/-)	9/-	7/9	10	15	8/9	..	8 11 6
Telegraph Condenser (10/-)	8/-	7/-¾	Nil	5	7/6	..	6 13 4
Telegraph Construction	39/-	34/6	10	10	37/6	..	5 6 8
Telephone Mfg. (5/-)	7/6	6/9	9	9	7/3	..	6 4 2
Tube Investments	92/6	89/-	23½	23½	90/-	..	5 5 9
Vactric (5/-)	2/3	2/-	4	Nil	2/3	..	—
Vickers (10/-)	16/-	14/-	10	10	15/-	..	6 13 4
Ward & Goldstone (5/-)	19/9	12/6	20	20	16/6	..	5 19 9
Westinghouse Brake	42/6	39/6	17½	10	40/-	..	5 0 0
Walsall Conduits (4/-)	26/6	24/9	55	55	26/3	..	8 7 6
West, Allen (5/-)	4/3	3/6	10½	7½	3/9	..	10 0 0

* Dividends are paid free of Income Tax.

CONTRACT INFORMATION

Tenders Invited and Accepted. Schemes Promising Electrical Work.

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses. Further details of items marked with an asterisk can be obtained from the Department of Overseas Trade (Inquiry Room), Millbank, Westminster, London, S.W.1.

Bridgend.—May 21st. Electricity Department. E.h.v. switchgear, transformers, e.h.v. and l.v. cables. (See this issue.)

Luton.—April 28th. Town Council. Lighting of tunnel shelters. (April 11th.)

Manchester. — April 30th. Electricity Committee. Cables. (April 11th.)

Salford.—April 28th. City Council. Fire extinguishing equipment. (April 11th.)

South Africa.—PRETORIA.—April 30th. City Council. Circulating water pumps and pump house equipment. (March 28th.)

Weymouth.—April 29th. Electricity Department. 11-kV overhead line. (April 11th.)

Orders Placed

Glasgow.—Health Committee. Accepted. Equipment for the new laboratory at the Southern General Hospital (£176).—Griffin & Tatlock.

Electricity Committee. Accepted. Two 10,000-kVA transformers (£4,450 each).—Bruce Peebles & Co.

Middlesbrough.—Town Council. Accepted. 2,000 yards of cable (£150).—Britannic Cable Co.

Runcorn.—U.D.C. Accepted. Wiring, transformer, four lights and services in 146 shelters and "Sigma" well glass fittings in 352 shelters (£1,775).—Mersey Power Co.

Wolverhampton. — Electricity Committee. Accepted. Cables and compounds for twelve months.—Callender's.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Ardwick.—Fish restaurant, New Street and Apsley Grove; S. G. Lowe, 3, Howarth Street, Chorlton-on-Medlock.

Auchtermuchty.—Reconstruction of police station, for Fife Police Committee; county clerk, County Buildings, Cupar.

Ballycastle.—Buildings, for the Dalriada District Institution, for Governors; M. J. Feerick, clerk, District Hospital.

Beswick.—Addition, bacon curing factory, for A. J. Mills & Co., Ltd.; H. Williams & Partner, 43, Bedford Square, W.C.1.

Birtley, Co. Durham.—Extensions to works, W. Norman, contractor, West Lane.

Boldon (Co. Durham).—Alterations and improvements to the Black Bull Hotel and the Railway Inn; Matkin & Hawkins, Barclays Bank Chambers, Sunderland.

Bradford.—Community centre, boys' club and children's creche, Canterbury Avenue housing estate, for T.C.; H. Connolly, city architect, Town Hall.

Brampton.—Combined depot, for Cumberland C.C.; J. H. Haughan, County Architect, 4, Alfred Street North, Carlisle.

Burnley.—Extensions, Wood End sewage works (£8,500), for T.C.; J. L. Beckett, borough engineer, Town Hall.

Cannock.—Pithead canteens; Cannock Chase Colliery Co.

Cheetham.—Alterations to works, for W. Timpson, Ltd.; W. Johnson & Son, architects, 27, Oldham Road, Miles Platting, Manchester.

Chesterfield.—Works extensions, for Robinson & Sons, Ltd.; Hodkin & Jones, Ltd., Queens Road, Sheffield.

Chorlton-on-Medlock.—Additions to bakery and battery charging workshop, Lincoln Grove, for R. Sharrocks & Sons, Ltd.; Andrews & Butterworth, architects, 9, St. James' Square.

Consett (Co. Durham).—Communal feeding centres for Consett U.D.C.; T. P. Leath, surveyor, Urban Council Offices, Blackhill.

Cradley Heath.—Office extensions, Foxoak Street; Arthur Edge & Co.

Warehouses and stores, Compton Road; Roberts Bros.

Croydon.—Emergency feeding centres (25), for T.C.; E. Taberner, town clerk, Town Hall.

Darley Dale.—Additions, Two Dales Flour Mills; A. Johnson & Sons.

Donnington Wood.—Church for the Congregational Union; Rev. D. P. Hopkins, chairman, Congregational Church, Broseley.

Dublin. — Camp equipment store, for Commissioners of Public Works; G. P. Fagan, secretary, Office of Public Works.

Gateshead-on-Tyne.—Factory stores.—Cackett, Burns Dick, & McKellar, Ellison Place, Newcastle-on-Tyne.

Haslingden.—Houses (100), Helmshore, for T.C.; borough surveyor, Council Offices, Haslingden, Rossendale.

Hebburn-on-Tyne. — Alterations and improvements at the Caledonian Hotel; Hetherington & Wilson, County Chambers, Newcastle-on-Tyne.

Hemsworth.—Firemen's houses (10), Moorthorpe Fire Station, South Kirkby, for R.D.C.; S. Price, surveyor, Market Chambers.

Horbury Junction.—Works extensions with transformer station and switch chamber; Chas. Roberts & Co., Ltd., Railway Wagon Works.

Lowestoft.—Library, borough engineer, High Street.

Macclesfield.—Additions and alterations to laundry block, Parkside Hospital, for Cheshire C.C.; F. A. Browne, county architect, The Castle, Chester.

Manchester.—Reconstruction of premises, St. Ann's Square, for Manchester Commercial Buildings Co., Ltd.; Francis Jones, architect, 178, Oxford Road, Ardwick, 12.

Middlesbrough.—Four communal feeding centres; C. Gorman, borough engineer, Town Hall.

Newton Heath.—Iron foundry and fitting workshop; Matthew Swain, Ltd., Holt Street.

Northampton.—Cottages (90), for R.D.C.; surveyor, Council Offices, 1, Spencer Parade.

North Riding.—Catering kitchens to be built at the Eston, Grangetown, Sir William Worsley and Thornaby schools; J. White, county architect, County Hall, Northallerton.

Nottinghamshire.—Ward blocks, Harlow Wood Orthopaedic Hospital; county architect, Shire Hall, Nottingham.

Ossett.—Substation building at pumping station, for T.C.; borough surveyor, Town Hall.

Rochdale.—New Fox Inn, Milnrow Road; R. S. Clegg.

Rushden. — Garage additions; United Counties Omnibus Co., Ltd., Houghton Road, Northampton.

Reconstruction of portion of Alfred Street School, for Northants E.C.; acting county architect, County Hall, Northampton.

Sheffield.—Completion of 239 houses, for T.C.; city architect.

Re-construction of shops, Angel Street and King Street; Symington & Croft, Ltd., King Street.

Partial re-building sales shops and showrooms; L. L. Jacobs, High Street and Change Alley.

Shops, etc., Union Street, for British Home Stores; A. L. Farman, resident architect, 221-223, Baker Street, London, W.1.

Shops and show rooms, The Moor, Horse Street, Moorhead; Roberts Bros. (Sheffield), Ltd., 32, The Moor.

Stafford.—Remand home for boys, Children's Cottage Homes, for County E.C.; K. L. Murray, county architect, County Buildings, Stafford.

Stanley (Co. Durham).—Twelve communal feeding centres.—J. R. Heslop, surveyor, U.D.C. offices.

Sunderland.—Alterations and additions to factory, for T. R. Robson; W. Pickering, contractor, Holmside.

Swansea. — Market buildings (£4,500); borough engineer.

Wolverhampton.—Temporary senior school, Marsh Lane, and adaptation of six schools for canteens, for E.C.; J. B. Allon, town clerk, Town Hall.

Worksop.—Conversion of shop property into municipal restaurant, for T.C.; borough engineer, Park House.

York.—Restoration of Assembly Hall for T.C.; C. J. Minter, city engineer, Guildhall.

Conditions in America

REPORTING last month on the state of the American electrical industry, the *Electrical World* stated that in the New York region some manufacturers were experiencing some difficulty in obtaining raw materials, which was delaying deliveries. While the situation was not critical, many believed that it would grow worse before it got better. The listing of priorities, with more to be added later, was forcing some manufacturers to substitute plastics for aluminium in some instances. Substitutes for materials being used for national defence were likely to become general.

Defence demands for various types of lighting and other electrical equipment had tightened the production schedules of some manufacturers and several producers were unable to take orders for delivery within the next few months. The latest Government orders included generators, circuit-breakers, cable, switchboards, welding outfits, disconnecting switches, motors, insulators, transformers and electric fans.

The first of what might prove to be a series of price advances on major electrical appliances, as a result of rising material costs and scarcity of metals, was announced by refrigerator manufacturers in raised quotations by $5 to $10 per unit. Sales of washers and ironers were continuing to show monthly increases over last year.

Overseas demands for American electric household refrigerators in 1940 was at the lowest level for seven years, exports being valued at $8,075,741 as compared with $9,539,657 in 1939, $10,767,791 in 1938, and $12,771,317 in 1937, according to the electrical division of the Department of Commerce, says *Reuter's Trade Service* from New York. Shipments of electric commercial refrigerators up to one ton followed the same trend as electric household refrigerators, the 1940 exports totalling $1,352,249 as compared with $1,790,792 in 1939.

Exports of electric household washing machines were valued at $1,196,947, a decrease of 44.3, 54.5 and 43 per cent. on the 1939, 1938 and 1937 totals respectively. Purchases of electric domestic vacuum cleaners by foreign buyers fell to a new low record for the last ten years, totalling $205,484 as compared with $382,231 in 1939. Exports of electric cooking ranges, on the other hand, were the highest since 1929; the total of $402,500 was 6.1 per cent. above the 1939 total of $379,180.